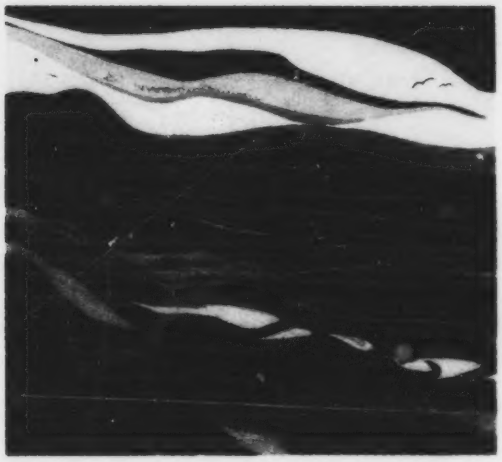
Looking Ahead: A Wild Life Strategy For Ontario



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The Ontario Wildlife Working Group

For:
The Minister of Natural Resources

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M7A 1W3

ONTARIO WILDLIFE WORKING GROUP

GROUPE DE TRAVAIL SUR LA FAUNE DE L'ONTARIO

May 7, 1991

The Honourable C.J. (Bud) Wildman
Minister of Natural Resources
Room 6301
99 Wellesley Street West
Toronto, Ontario
M7A 1W3

Dear Mr. Wildman:

It is our pleasure to present to you our report: Looking Ahead: A Wild Life Strategy For Ontario.

Respectfully submitted,

C. David Fowle (Chair)

Ross James

Shirley McAfee-Ryan

Katherine McKeever

Douglas Ogston

Douglas Probble

François Ribordy

Robert Stewart (Vice-chair)

Jane Straatman

David Watton

Christopher Wren

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Wildlife Working Group

C. David Fowle (Chair)
Thornhill

Ross James
Sunderland

Shirley McAfee-Ryan
Arrow Lake - Thunder Bay

Katherine McKeever
Vineland

Douglas Ogston
Lively

Douglas Prebble
Kenora

François Ribordy
Sudbury

Robert Stewart (Vice-chair)
Kingston

Jane Straatman
Petrolia

David Watton
Bracebridge

Christopher Wren
Guelph

Secretariat and Associates

Members

Mark Garscadden (Vice-chair)

Paul A. Gray (Chair)

Carol-Ann Itel

Trevor Kellar (Vice-chair)

Lorraine McGivan

Nina Pileggi

Workshop Facilitator

Robb Ogilvie
Ogilvie, Ogilvie & Company

Contract Editor

Jane Naczynski
WordSource Corporate Communications

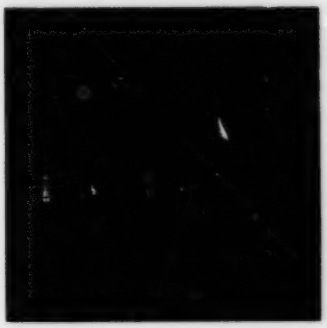
The Working Group and the Secretariat would like to acknowledge **Ed Addison** for his outstanding contribution to the workshops, background research and field trips.

The Secretariat acknowledges the assistance of **Andrew Taylor** during the summer of 1990.

Foreword

■ Starting with a clean slate and wide public consultation, prepare a wild life strategy which will re-orient and revitalize the provincial wild life program as we move into the 21st century. That was the charge to the Wildlife Working Group as it set about its task in July, 1989.

This report is the response and the responsibility of the Working Group. But it draws its strength from the contributions of hundreds of people who joined us in workshops, interviews, discussions or provided many valuable ideas in reports, submissions and letters. We are grateful to all for their participation in this historic undertaking.



(Credit: Ross James)

The Strategy poses a number of challenges to the people of Ontario and their government. It calls on them to accept responsibility for the stewardship of all living nature. We have highlighted this challenge by replacing the word "wildlife" with "wild life" to symbolize the broad definition we recommend be adopted.

We urge the implementation of the Strategy through an ecosystem approach to ensure the conservation of the diversity of life in Ontario. The Working Group believes that the time has come to demand a more responsible and respectful attitude toward nature, at all levels from the total environment to individual plants and animals. We recognize that, while holding animals in captivity may serve some important but limited purposes, the proper place for wild life is in the wild.

The future of wild life will depend on our willingness to provide living space for it. In the past, habitat and wild life species have been lost or threatened through neglect or lack of understanding of how our actions affect ecosystems. We must do better by doing things more carefully in order to retain that living heritage which is so profoundly a part of the image of Ontario.

The issues discussed in this report are not unique to Ontario. They are also a challenge to those now responsible for wild animals across the country and, indeed, around the world. Agencies assigned the task of looking after resources such as forests, fish and other wild animals, find themselves in a paradoxical position. They are the official stewards of resources, which are major components of the economy and are highly esteemed by the vast majority of people who spend billions of dollars in pursuit of benefits from them. Yet the agencies are, for the most part, woefully underfunded and understaffed in relation to the economic, cultural, social and eco-

logical values associated with these resources. Ontario is no exception.

This report is not a "final report" but rather a first step towards a new way of thinking about wild life in Ontario. The Working Group began its task by seeking the participation of many partners. It ends its task by recommending that this must be the way of the future. We cannot by ourselves solve the problems we see from our own limited perspectives. We need each other, to work together, to share information, challenge philosophies and to act with restraint and patience. We must have innovation – new ways of doing things to meet future needs. We need everybody's ideas and the widest possible participation.

Acknowledgements

■ Many people made this Strategy happen. The Wildlife Working Group and the Secretariat would like to acknowledge the following people with the Ministry of Natural Resources who took time to provide, collect, collate, organize and summarize excellent background material, or provide comments, in support of the Strategy: Edward Addison, Jim Baker, Alan Bisset, Moi Chromec, Mel Crystal, Mike Eckersley, David Euler, Doug Hagan, John Harcus, Dave Hogg, David Hussell, Fred Johnson, John Johnson, George Kolenosky, Charlie MacInnes, Stuart Mallany, Dan Mansell, Ken Morrison, Angus Norman, Milan Novak, Martyn Obbard, Brian O'Donnaghue, Bruce Pond, Paul Prevett, John Riley, Murray Smith, Peter Smith, Roxanne St. Martin, Mark Stabb, Ray Stefanski, Dan Strickland, Monika Turner, Len Ugarenko, Laurel Whistance-Smith, and Owen Williams. Brian Tapscott from the Ministry of Agriculture and Food provided similar material and we thank him. Tim Timmerman co-ordinated a very informative field trip in the north, and the staff of Communications Services guided the translation and printing of this document. Layout was co-ordinated by Ruth Latimer.

Stan Rowe (University of Saskatchewan) provided valuable comments on the ecosystem approach, and Ed Wiken, Brian Rizzo, Gary Ironside, and John Reid (Environment Canada) provided material and comments on ecological land classification, values, and climate change.

We would also like to extend our heartfelt thanks to the many people who participated in the workshops which were so essential to the development of this Strategy. In the workshops we detected a growing sense of mutual understanding and respect among the many groups interested in wild life, and more important, a collective sense of concern and purpose for the well-being of wild life with which we share our common environment.

The Wildlife Working Group thanks George Tough, Deputy Minister, Ministry of Natural Resources, and Ron Christie, former Executive Director, Outdoor Recreation Group, for their continued support throughout the duration of this initiative.

The Working Group also wishes to extend its thanks to Donald Simkin, former Director of the Wildlife Policy Branch, for his enthusiastic support and encouragement when we set out in July, 1989.

We are also grateful to Jim MacLean, Director of the Wildlife Policy Branch for his interest in our work and for the advice and support of his staff who assisted us in many ways.

We wish in particular to acknowledge our debt to the Secretariat for tireless and enthusiastic participation in all aspects of our work and for many hours

of overtime at night and week-ends. We wish especially to commend the outstanding contribution of Paul Gray, whose thoughtful advice, unbounded energy and determination kept us all at work and on track. His is a major contribution to the Strategy and we and all those who use this document are indebted to him.

Summary

A Wild Life Strategy for Ontario

Goal of the Strategy

A diversity of healthy ecosystems and associated wild life populations and habitats that provide sustained social, cultural and economic benefits for all people.

Objectives of the Strategy

- Maintenance of biodiversity.
- Rehabilitation of degraded ecosystems.
- Treatment of all wild life in a responsible and respectful manner.
- Widespread appreciation of the importance of wild life and healthy ecosystems.

Guiding Concepts

- Use of wild life should be permitted only if the population of the species involved is self-sustaining.
- Humans are an integral part of ecosystems.
- It is inevitable and acceptable that our needs will have impacts on ecosystems.
- Ecosystems change continuously as a result of natural influences and human disturbance.
- Ecosystems have a finite capacity to absorb natural and human disturbance.
- Placing wild life in artificial environments should, with few exceptions, be prohibited.
- With few exceptions, human contact with live wild life should occur in the wild.
- Permission to hold wild life in captivity should be conditional on the provision of adequate, considerate, and competent care.

Defining Wild Life

Strategy 1: The Government of Ontario should adopt a comprehensive definition of wild life.

The Working Group recommends the following definition: "wild life means all wild mammals, birds, reptiles, amphibians, fishes, invertebrates, plants, fungi, algae, bacteria, and other wild organisms."

A Comprehensive Approach to the Stewardship of Wild Life

The Ecosystem Approach

Strategy 2: Adopt an ecosystem approach to management.

A Wild Life Policy

Strategy 3: Create a wild life policy for Ontario.

Leadership

Strategy 4: Designate the Ministry of Natural Resources as the lead Ministry to assume responsibility for the stewardship of wild life.

Legislation

Strategy 5: As a matter of urgency, the Ministry of Natural Resources should undertake, in co-operation with the appropriate ministries, non-government organizations and other relevant partners, a review of the adequacy of existing legislation relating to wild life, the protection of habitat, and consider the need for amendments and new legislation.

Strategy 6: The Government of Ontario take immediate steps to declare ownership of native wild life.

Biodiversity

Research

Strategy 7: Enhance research and the flow of appropriate data and information from all sources as a basis for the maintenance and enhancement of biodiversity.

A Geographic Basis for Management

Strategy 8: Adopt an ecological land classification system for Ontario.

Information Management Systems

Strategy 9: Develop a data and information management system which is compatible and integrated with the ecological land classification framework.

Monitoring and Inventory

Strategy 10: Establish an expert committee on monitoring to advise on the development of monitoring systems at provincial, regional and local levels.

Strategy 11: Establish management unit boundaries based on an ecological land classification system, and collect the data and information necessary to set biodiversity objectives for each unit.

Protection of Ecosystems

Strategy 12: Ensure that Ontario has a system of protected areas which adequately represents ecosystems, landscapes and their wild life populations.

The Special Case of Rare, Threatened and Endangered Species

Strategy 13: Develop a policy on rare, threatened and endangered species.

Cumulative Impacts

Strategy 14: Include detection of cumulative impacts in monitoring programs and require assessment of potential cumulative effects in planning and approval procedures.

Climate Change

Strategy 15: Take account of the most up-to-date data and information on climate change and predicted effects on all long-term planning, inventory and monitoring programs for habitat and populations.

Habitat

Habitat Inventory and Monitoring

Strategy 16: Upgrade and continue to develop wild life habitat inventory and monitoring programs.

Habitat on Public Lands

Strategy 17: Improve the management of public lands for their wild life values.

Urban Development

An Urban Wild Life Program

Strategy 18: Develop and implement an urban wild life program for Ontario.

The Impact of Urban Development

Strategy 19: Mitigate the impacts of development on wild life habitat.

Wetlands

Strategy 20: Ensure no loss of wetland function of Class 1, 2, and 3 wetlands.

Strategy 21: Evaluate the ecological significance of wetlands in northern Ontario.

Habitat on Agricultural Land

Strategy 22: Maintain wild life habitat diversity on agricultural lands in a manner compatible with agricultural practice.

Strategy 23: Co-operate in the rehabilitation of wild life habitat on agricultural lands in a manner compatible with agricultural practice.

Forest Management

Strategy 24: Maintain wild life habitat diversity on forest lands.

Strategy 25: Rehabilitate degraded wild life habitat on forest lands.

Some Aspects of Wild Life Populations

Population Inventory and Monitoring

Strategy 26: Develop and continue to upgrade wild life population inventory and monitoring programs.

Wild Life Health: Parasites and Diseases in Animals

Strategy 27: Improve monitoring of diseases and parasites.

Strategy 28: Ensure effective disease and parasite program planning and management.

Introductions into the Wild

Strategy 29: Strictly control introductions into the wild.

Introduction of Genetically-Engineered Organisms

Strategy 30: Strictly control the introduction of genetically-engineered organisms.

Wild Life Conflicts

Strategy 31: Develop a comprehensive strategy and program to address human/wild life conflicts.

Disturbance from Recreational Activities

Strategy 32: Control disturbance from recreational activities on wild life.

Use of Wild Life

Paying for Wild Life

Finding a Method

Strategy 33: Develop a "beneficiary pay" policy.

Funding

Strategy 34: Increase funding for wild life protection and management programs.

Allocation of Wild Life

Strategy 35: Establish an allocation process within an ecosystem approach to the protection and management of Ontario's wild life.

Providing Access to Wild Life

Strategy 36: Establish a Task Force to review the use of wild life in protected areas.

Strategy 37: Manage access.

Cultural Aspects of Wild Life Use

Aboriginal Peoples

Strategy 38: Encourage aboriginal peoples to participate in wild life protection and management programs.

Other Cultures

Strategy 39: Encourage Ontarians of all cultures to participate in wild life protection and management programs.

Monitoring Socio-Economic Trends

Strategy 40: Monitor socio-economic trends.

Poaching

Strategy 41: Strengthen the ability of the Ministry of Natural Resources to combat poaching, with particular emphasis on commercial operations.

Wild Life in Captivity

Taking Live Animals into Captivity

Strategy 42: Prohibit the taking of live native animals, except by special licence.

Holding Live Animals in Captivity

Strategy 43: Ensure that no wild animals are held in captivity, except under special licence.

Zoos and Aquaria

Strategy 44: Ensure that all zoos and aquaria are licensed.

Animal Shows, Exhibits, and Displays

Strategy 45: The Government of Ontario should prohibit animal displays, shows, and exhibits featuring live native wild animals.

Use of Captive Animals for Recreation and as Pets

Strategy 46: Prohibit the keeping of animals in captivity for recreation except in those circumstances where special regulations, controls and legislation have been brought into force.

Pet Stores

Strategy 47: The keeping and sale of native wild animals by pet stores should be prohibited.

The Biological Supply Industry

Strategy 48: Prohibit the collection and propagation of live native wild life and the collection of dead native wild life for commercial purposes, except under special licence.

Game Farming and Game Ranching

Farming Native Wild Life

Strategy 49: Prohibit game farming of native animals and game ranching of all animals.

Farming Non-Native Species

Strategy 50: Freeze (no purchase of new stock, no establishment of new enterprises) game farming for non-native ungulates until June 1992.

Ensuring the Industry is Safe

Strategy 51: Develop safeguards for the game farming of any new species prior to its use being authorized.

Fur Farming

Strategy 52: Prohibit the use of any additional species for fur farming.

Strategy 53: No additional animals should be taken from the wild for fur farming.

Sick, Injured, and Orphaned Animals

Strategy 54: Recognize and foster a wild life rehabilitation program in Ontario.

Live Native Plants

Strategy 55: Control the taking of live wild native plants.

Plant and Animal Collections

Collecting for Personal Use

Strategy 56: Regulate the collection of plants and animals for personal use.

Public and Institutional Collections

Strategy 57: Regulate the collection of plants and animals for inclusion in public and institutional collections.

Hunting

Impacts of Hunting

Strategy 58: Allow hunting to continue within the limits of sound ecological management.

Strategy 59: Expand the hunter education program in Ontario

Types of Hunting

Strategy 60: Review the impacts of various hunting techniques employed in Ontario, including wounding rates.

Trapping

Strategy 61: Allow trapping to continue within the limits of sound ecological management.

Wild Life Viewing

Strategy 62: Encourage viewing of wild life.

The Changing Landscape

Ontario...

Ontario is a province of diverse and contrasting landscapes and home to a corresponding diversity of wild life. There are more than 2,900 species of vascular plants, about 160 species of fish, approximately 80 species of amphibians and reptiles, nearly 400 species of birds and about 85 mammals. There are thousands of kinds of insects and other invertebrates and a large array of mosses, lichens, fungi, algae and micro-organisms. All are assembled in various combinations in countless living communities across the Province, ranging from Tundra on the shores of Hudson Bay in the north to Deciduous Forest on the shores of Lake Erie in the south.

The people of Ontario place a high value on this heritage. A survey conducted in 1987 estimates that more than 90 per cent of Ontarians participate in one or more activities related to wild life. More than 85 per cent of the respondents believe it is important to maintain abundant wild life and to preserve endangered and rare species. Interactions with wild life by Ontarians, other Canadians, and international visitors provide billions of dollars to the provincial economy. For example, in 1987 Ontarians alone spent 1.6 billion dollars on activities related to wild life.

Statistics do not tell the whole story. There are few measures to assess the recreational, educational, cultural and spiritual rewards derived from interaction with nature or the companionship, memories and adventure which are associated with outdoor activities such as hunting, bird-watching, fishing, hiking, canoeing and camping. These activities lie at the heart of the desire to maintain wild nature and for the present concern for its future.

In Ontario, we are fortunate to have retained much of the original diversity of wild life but we must not be complacent about its future. Since the Province was first settled, there have been changes in the variety, number and distribution of many species. Some have been extirpated, the geographic ranges of some have shrunk while others have expanded, and immigrants and introduced species have taken up some of the space formerly occupied by native species. The expansion of human populations, urban development, agriculture and timber harvest, along with other activities, continue to diminish the living space for wild life.

To retain our wild life heritage, we need a strategy to guide us and remind us of the need to protect the wholeness of ecosystems and to limit our demands on them to what can be safely supplied or absorbed and processed.

A satellite image of Ontario. "Our Common Future", the report of the World Commission on Environment and Development, attracted world-wide attention and pointed to the need for a comprehensive and integrated approach to environmental problems at all levels – from global to local.
(Credit: Canada Center for Remote Sensing)

THE CHANGING LANDSCAPE

■ It was the European demand for fur in the early 1600s which led to the first settlements in Canada at trading posts in the Maritimes, and later in the St. Lawrence Valley and on the shores of the Great Lakes. In 1670, the future Hudson's Bay Company received a royal charter authorizing it to develop the trade in the vast region draining into Hudson Bay. At that time Ontario was almost entirely covered by forest. However, the arrival of the fur traders marked the beginning of more than 300 years of change, characterized by population growth, the spread of European cultures and values, and increasing pressure on the land for living space and resources.

Settlement changed many ecosystems. (Credit: Ministry of Natural Resources)

One of the first pieces of legislation enacted in Upper Canada addressed the need to protect white-tailed deer. (Credit: Ministry of Natural Resources)

Over the next hundred years European immigrants settled along the north shores of Lakes Ontario and Erie. Between 1783 and 1797 the population increased after the American Revolution by an influx of Loyalists, British soldiers and mercenaries from the United States who came to take advantage of land grants and other incentives, and by the continuing flow of immigrants from Europe. By 1840, settled lands extended north to Goderich and to a line running eastward through Lindsay, Peterborough, Perth and Pembroke.

To the settlers, the forests of the New World seemed to provide limitless land, building materials, fuel, water and game for food and clothing, but, at the same time, they were a barrier which had to be pushed back to make room for people. In 1839 Anna Jameson wrote that *"... a Canadian settler hates a tree, regards it as his natural enemy, as something to be destroyed, eradicated, annihilated by*

all and any means." Animals which provided food, hides and other useful products were hunted heavily, with little consideration for the long-term effects until it was realized that some species, such as the white-tailed deer, might be threatened.

One of the first pieces of legislation enacted in Upper Canada was *"An Act for the Preservation of Deer within this Province"* (1821). It was followed over the next one hundred and seventy years by other acts, regulations and amendments designed mainly to set hunting seasons and bag limits.

By far the most important impact of settlement on wild life was the alteration of the original forest, which destroyed habitat for many species, and created it for others. In southern Ontario, animals such as the Canada lynx, marten, fisher, southern flying squirrel, wild turkey and spruce grouse, and plants such as gensing and purple twayblade, were virtually eliminated or greatly reduced. Others, such as the loggerhead shrike, woodchuck, eastern cottontail rabbit and numerous alien plants (many of which became weeds) moved into the newly-created habitats.

Change brought about by settlement was slower in northern Ontario where the impetus to development was the forest industry. Its beginning was marked in 1806 by the successful navigation of a raft of pine from the Ottawa Valley down the Ottawa and St. Lawrence Rivers to Quebec City for export to Britain. The sawmill industry expanded northward and by the 1890s was well established in south central Ontario as well as on major rivers along the north shore of the Great Lakes and in Rainy River country. It prospered by supplying the domestic building trade and the large market in the United States.

> *"... a Canadian settler hates a tree, regards it as his natural enemy, as something to be destroyed, eradicated, annihilated by all and any means. (Anna Jameson, 1839).*

Pulp mills began operating in 1895, but high capital costs and financing problems hampered real development until about 1920. Since then, large areas of northern Ontario forest continue to be harvested for pulp and saw logs, with consequent changes in the character of

Ontario's rivers once served as "highways" for logs being moved to the mills.
(Credit: Ministry of Natural Resources)

the vegetation and populations of animals which depend upon it.

As resource and industrial development continued, Ontario evolved from a rural to an urban society. Although the provincial population has grown from about two million in 1901 to more than nine million today, the rural component has remained fairly stable, between 1.2 and 1.4 million. The ratio of rural-to-urban population shifted from 70/30 in 1901 to about 20/80 in 1981.

The growing population required more land for homes and industry, and for supporting infrastructure, such as roads and utility corridors. For example, the population of Barrie increased 156 per cent between 1966 and 1988, while, in the same period, more than 33,000 hectares of mainly rural land were consumed by urban growth in the Toronto region.

Two centuries of development have eliminated or significantly modified more than 90 per cent of the Deciduous (Carolinian) Forest, and 70 per cent (more than one million hectares) of southern Ontario's wetlands. The Point Pelee Marsh has been reduced by more than 70 per cent since 1880 and the St. Clair marshes by nearly 40 per cent since 1915. Hundreds of other, smaller wetlands have been drained for cultivation or development. The loss of wetlands is serious because they serve many functions and, as the richest of all habitats, support the greatest diversity of plants and animals.

Change since the early days of settlement has brought a high standard of living to Ontario, but there have been considerable costs to the environment due to pollution, loss of amenity and changes in populations of wild life and habitats. Despite these changes, the Province is still relatively rich in wild life. However, if we are to retain it, we must profit from and apply the lessons of the past as we look to the future.

The forest industry has always played an important role in the social, cultural and economic development of Ontario. (Credit: Ministry of Natural Resources)

By far the most important impact of settlement on wild life was the alteration of the original forest, which destroyed habitat for many species, and created it for others.

CHANGING VALUES

■ Less than one hundred years ago it was widely believed that humans were a unique creation, separate from the rest of nature and destined to have dominion over it. The notion of our "right" to dominate and exploit often fostered arrogant and thoughtless behaviour in our relations with the natural world. Gradually, however, we have come to realize that we are as much a dependent part of nature as all other living things.

In recent years, this change in attitude has found expression in a vital social movement. People are rethinking the way they relate to their planet. The underlying philosophy, to some degree, is captured in the word "environmentalism", expressing an holistic and caring attitude. People are re-assessing traditional concepts about the way the world works, and how we should conduct ourselves within it.

The environmental movement of the 1960s and 1970s brought about many changes. Words such as "ecology" and "ecosystem" became part of the vocabulary of the media and society in general. Concern for the environment was expressed in a resurgence of established non-government organizations and the creation of new ones. Education authorities introduced "the environment" into school curricula, and university courses were offered in environmental management and environmental law. These attitudinal changes have become incorporated in the policies and programs of many environmental and wild life agencies around the world. There have been attempts to rehabilitate some degraded ecosystems such as, for example, the Great Lakes, where progress has been made in improving water quality. There is an increasing awareness of the need for measures to conserve and restore wetlands. Concern for the decline of habitat, the need to protect representative

The white pine, once a symbol of development, is now a provincial emblem.
(Credit: Ross James)

populations and ecosystems, and the need for access to wild life, played a role in securing a major increase in the number and area of provincial parks and other protected lands in Ontario in 1983.

In the course of its consultations, the Working Group detected a sense of optimism, even excitement, about the changes that are occurring.

At the international level, "Our Common Future" (1987), the report of The World Commission on Environment and Development, attracted world-wide attention, hastened the evolution of environmental thought, highlighted the universality of our problems, and emphasized sustainable development. It pointed to the need for a comprehensive and integrated approach to environmental problems at all levels – from global to local.

There were many responses to the Report. Canada assumed a lead role in sponsoring international conferences on sustainable development, climate change, acid precipitation, and one reviewing the World Conservation Strategy. The provinces established Round Tables on Environment and Economy. In Ontario, environmental action has taken such forms as the Class Environmental Assessment for Timber Management, the Royal Commission on the Future of the Toronto Waterfront, the Greater Toronto Area Greenlands Strategy, the Strategic Plan for Ontario Fisheries (SPOF), and the Challenge Paper of the Ontario Round Table on Environment and Economy. In addition, the importance of some provincial wetlands has been recognized internationally under the Ramsar Convention, and Long Point and the Niagara Escarpment have been designated Biosphere Reserves by the United Nations. Many non-government organizations also are making significant contributions. The Conservation Council of Ontario, for example, is currently working on an Environmental Strategy for Ontario, and other non-government organizations are participating in the Class Environmental Assessment for Timber Management.

In the course of its consultations, the Working Group detected a sense of optimism, even excitement, about the changes that are occurring. There were consistent messages about the need to re-examine the values on which we base our decisions, especially in a society whose values range from the strictly pragmatic, to the most profoundly spiritual.

There were consistent messages about the need to re-examine the values on which we base our decisions, especially in a society whose values range from the strictly pragmatic, to the most profoundly spiritual.

Traditionally, wild life management has focused on populations and habitat. This approach recognizes that individuals die of numerous causes, and that death is inevitable, frequent and often violent under natural conditions. Populations are maintained through the interplay of reproduction and mortality.

However, there are other perspectives. There are some people whose concerns centre not on populations or ecosystems but on the welfare of individual animals, particularly when they are injured, orphaned or suffer as a consequence of contact with humans. People with this perspective have a sense of responsibility for these animals and are dedicated to helping them.

There is also some opposition to hunting, trapping or the taking of wild animals into captivity. There are regional differences in attitudes toward wild life in the more rural north and the urban south.

In view of this variety of perspectives, the Strategy and policies which may grow out of it must be flexible and seek to accommodate a broad spectrum of interests. To obtain the necessary understanding, we will have to draw not only on the biological sciences, but also turn to philosophy, sociology, psychology, economics, geography and other disciplines.

In view of this variety of perspectives, the Strategy and policies which may grow out of it must be flexible and seek to accommodate a broad spectrum of interests.

LOOKING AHEAD

A vigilant juvenile hawk owl surveys the surrounding landscape. (Credit: Ross James)

■ Predicting the future is risky, but we can anticipate some changes. The present population of Ontario is about nine million, and projections suggest that by 2005 it will be 10.3 - 11.3 million – a potential increase of nearly 15 per cent. Ontario will become more urbanized – particularly in the south where, in 30 years, about half of all Ontarians (nearly 20 per cent of all Canadians) will be living in the Greater Toronto Area. This could translate into an increase in urbanized area from 1,500 to 2,400 km^2, or an area approximately three to five times the size of Killarney Provincial Park. The area of land devoted to housing, urban development, industrial programs, and associated facilities will increase with consequent changes in wild life habitat. At the same time, the desire for contact with nature within and near urban areas may well increase.

Nearly all the remaining undeveloped land in the south is privately owned; clearly, its future rests in large part with the owners. As the human population and intensity of land use increase, there will be pressure to develop remaining natural areas. Competition for land will increase and it will become more difficult to acquire and protect it as wild life habitat. Ontario's northern landscapes will continue to be changed by timber harvesting, other industrial development, the expansion of urban areas, tourism and other activities.

We now understand that our past disregard for the long-term consequences of our actions has contributed to the current state of affairs. Our approach must change. A more comprehensive planning framework is needed as a basis for action. Part of such a framework is proposed in this Strategy.

We now understand that our past disregard for the long-term consequences of our actions has contributed to the current state of affairs. Our approach must change.

DEVELOPING THE STRATEGY

■ The recognition by the Ontario Ministry of Natural Resources that its wild life programs lacked the policies and resources to meet current and future challenges, prompted the appointment of the Ontario Wildlife Working Group in July, 1989. The eleven-member Group was charged with recommending a Wild Life Strategy for Ontario for the Minister of Natural Resources. The Wildlife Working Group regrets that aboriginal peoples' organizations declined the invitation to have a member on the Working Group.

Its terms of reference (Appendix 1) required the Group to begin its task with extensive public consultation. This included a series of four workshops attended by invited representatives of government agencies, non-government organizations, academic institutions and individuals. The workshops were designed to seek advice from people with a wide spectrum of experience, knowledge and viewpoints as to the general content of the Strategy, including identification of the issues and actions that might be taken to address them. Each of the workshops sponsored by the Group was attended by 60-80 delegates from all parts of the Province.

The first workshop focused on identifying issues. The three subsequent workshops were organized around four themes:

- The usefulness of an ecosystem approach.
- Issues and actions relating to habitat.
- The management of populations.
- The use of wild life.

A more comprehensive planning framework is needed as a basis for action.

The workshops yielded a wealth of information and ideas, and the enthusiasm of the participants was a source of inspiration and encouragement to the Working Group. The information from the public workshops was enhanced by parallel workshops for Ministry staff, sponsored by the Wildlife Policy Branch in which members of the Working Group benefitted from discussion with those directly involved in Ministry programs.

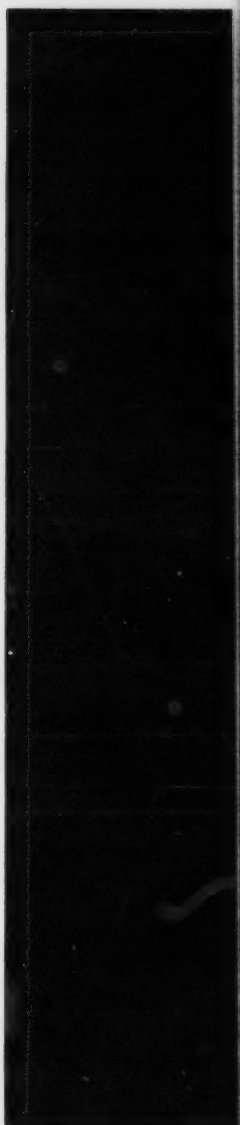
In addition to the workshops, the Working Group sought information and advice from others: from wild life and conservation agencies and individuals across North America, from the world literature, through visits to a number of Ministry offices and field operations, and from discussions with representatives of non-government organizations and academic institutions. It also received a number of written submissions from organizations and concerned individuals. A list of people who contributed thoughts and ideas to the Wildlife Working Group during its deliberations is included in Appendix 2.

Identifying concerns and issues and proposing a Strategy to address them was the assignment of the Wildlife Working Group. This is a formidable task which will not end with the production of this report. We are confident that it has laid a foundation upon which an evolving strategy and policies can be built over the years, as knowledge and experience grows.

IMPLEMENTING THE STRATEGY

■ A Strategy is a guide to action. It is a statement upon which government can base its policies (statements of intent), legislation, regulations, and programs. The most common tools for implementing a strategy are: acquiring and communicating knowledge, legislation and regulations, partnerships, and provision of funding to facilitate action, or to provide incentives. The Working Group recognizes the importance of these mechanisms as applying to virtually all of the proposed strategies in this document. However, the fact that we do not refer to them in every case does not mean that we consider them to be unimportant.

A Wild Life Strategy for Ontario



GOAL OF THE STRATEGY

■ A goal and its objectives are desired end products. In order for the Ministry of Natural Resources to address the issues and concerns relating to wild life during the next 25 years, it must adopt a broad, encompassing goal focused on ecosystems and human behaviour towards ecosystems. The recommended goal is:

> *A diversity of healthy ecosystems and associated wild life populations and habitats that provide sustained social, cultural and economic benefits for all people.*

> *"There is no end to this path — our present notions will as surely be outdated as those which we here outdate. We seem due at this moment for a worthwhile advance."*
> *(Aldo Leopold, 1933, "Game Management").*

OBJECTIVES OF THE STRATEGY

Biodiversity: is a short form for biotic or biological diversity – refers to the variety of wild life species, the genetic variability of each species, and the variety of different ecosystems they form.

■ The objectives identify specific actions necessary in the overall pursuit of the goal. They recognize that humans are a part of nature and that our influence on ecosystems will continue. It would be unrealistic to attempt to meet the goal by requiring the cessation of human activities, such as urbanization, agriculture, timber harvesting, and some of the traditional uses we make of wild life. But it is clear that some changes will be necessary to reach the following objectives:

- Maintenance of biodiversity.
- Rehabilitation of degraded ecosystems.
- Treatment of all wild life in a responsible and respectful manner.
- Widespread appreciation of the importance of wild life and healthy ecosystems.

GUIDING CONCEPTS

■ The Working Group used the following concepts in developing the Strategy:

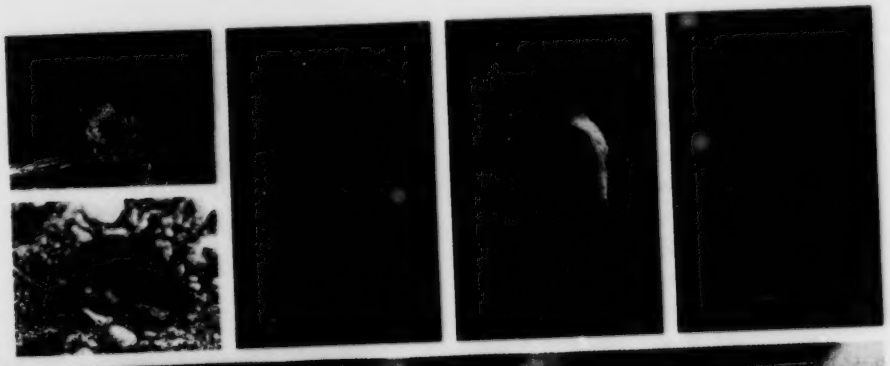
- *Use of wild life should be permitted only if the population of the species involved is self-sustaining.*
- *Humans are an integral part of ecosystems.*
- *It is inevitable and acceptable that our needs will have impacts on ecosystems.*
- *Ecosystems change continuously as a result of natural influences and human disturbance.*
- *Ecosystems have a finite capacity to absorb natural and human disturbance.*
- *Placing wild life in artificial environments should, with few exceptions, be prohibited.*
- *With few exceptions, human contact with live wild life should occur in the wild.*
- *Permission to hold wild life in captivity should be conditional on the provision of adequate, considerate, and competent care.*

DEFINING WILD LIFE

■ For many years it has been customary in government programs to use the word "wildlife" in reference to animals which are hunted or trapped. Sometimes species of special status, such as rare, threatened or endangered plants and animals, have been included. However, government wild life programs should no longer be confined to a narrow selection of species. The current range of interest and concern extends to all of wild nature and calls for a new and broader definition.

This is no reflection on the more traditional focus of the Ministry's wild life programs, many of which are highly regarded. It does, however, say that the time has come to expand programs to meet the needs of wild life and the range of expectations of the people of Ontario.

Wild life means all wild mammals, birds, reptiles, amphibians, fishes, invertebrates, plants, fungi, algae, bacteria, and other wild organisms. Examples include: (top left) the sundew, one of Ontario's insect-eating plants (Credit: Ross James); the deer mouse (middle left) (Credit: Ministry of Natural Resources); the fungi (middle-left) (Credit: Peter Smith); the northern three-toed woodpecker (middle-right) (Credit: Ross James); the fireweed (far right) (Credit: Paul Gray); and the swallowtail butterfly and the orange hawkweed on which it rests (bottom) (Credit: Ross James).



Wild life: means all wild mammals, birds, reptiles, amphibians, fishes, invertebrates, plants, fungi, algae, bacteria, and other wild organisms.

Strategy 1: The Government of Ontario should adopt a comprehensive definition of wild life.

It is recommended that the provincial government adopt the following definition: *"Wild life means all wild mammals, birds, reptiles, amphibians, fishes, invertebrates, plants, fungi, algae, bacteria, and other wild organisms."*

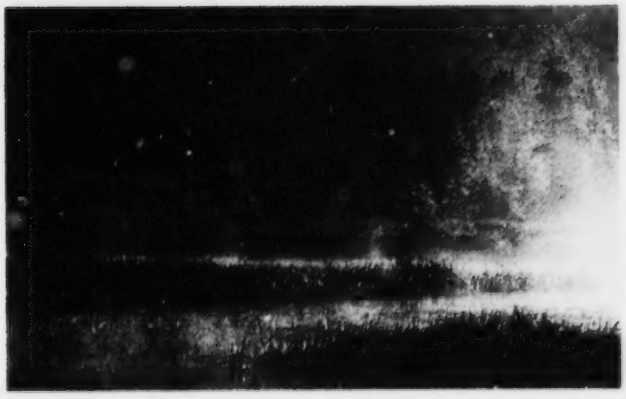
This definition is consistent with that of "A Wildlife Policy for Canada" (adopted by the Wildlife Ministers' Council of Canada, September, 1990). Further, the Working Group recommends that "wildlife" be replaced by "wild life", in order to emphasize the inclusive nature of the definition, and that native wild life be defined to include plant and animal species (including their progeny) that are indigenous to Ontario, have been imported, or have entered the Province by any other means, and survive as self-sustaining populations in the wild.

It is important to clarify the operational significance of this definition. Its adoption will signify the recognition of the need to have regard for all species of wild life. It does not mean that monitoring or "management" programs will be required for every one. Indeed, there are already large programs within the Ministry relating to forests, fish, some mammals, birds, other vertebrates and even insects. Moreover, there are parks and other reserves for the protection of ecosystems. In the next few years, Ministry programs may very well be broadened to include species and objectives not now addressed. At this point in our history, it is important to adopt a definition which reflects the reality of nature and our responsibility for it.

...native wild life be defined to include plant and animal species (including their progeny) that are indigenous to Ontario, have been imported, or have entered the Province by any other means, and survive as self-sustaining populations in the wild.

An ecosystem: is a network of living things (such as plants and animals, including humans) and non-living components of their environment (such as air, soil and water), interacting with each other and with other ecosystems. Most ecosystems are powered by solar energy and bound together through a network of food chains: green plants use solar energy to manufacture organic substances from carbon dioxide in air, from the water, and from nutrients in the soil; plants, in turn, support populations of herbivores which, in turn, provide food for carnivores. And when an organism dies its body is recycled by decomposer organisms such as bacteria and fungi.

The concept of linkages and interactions in ecosystems can be applied at many levels. The largest is the ecosphere, the thin layer at the surface of the earth in which life is possible. At the other extreme are the interactions in a small pond, in a rotting log, or in a garden. Lying between these extremes are the large regional landscapes, which may include many identifiable ecosystems, all working the same way: driven by finite amounts of sunlight and constantly recycling material and transferring energy in food webs. This is the productive machine that supports the diversity of wild life in Ontario. Ecosystems are dynamic, constantly changing on local scales, while providing each species with its unique life requirements within a series of progressively larger ecosystems



An ecosystem approach means an holistic approach
(Credit: Peter Smith)

A COMPREHENSIVE APPROACH TO THE STEWARDSHIP OF WILD LIFE

■ The adoption of a comprehensive definition of wild life requires a comprehensive approach to the way we care for it. Since experience has taught us that it is virtually impossible to "manage" selected species without affecting other species, we must address the whole environment – the ecosystem.

Strategy 2: Adopt an ecosystem approach to management

The ecosystem approach means:

- *Adopting an holistic view of the natural world.* In our relationships with parts of the ecosystem – for example, individual species, plant communities, streams, and lakes – we must deal with them within the context of the ecosystem in which they exist.
- *Recognizing complexity and interconnections.* Ecosystem parts are interconnected through food webs and in other ways. Our actions, directed at certain parts of the ecosystem, must anticipate the possible consequences on other parts. We need to be prudent, given our limited knowledge of how ecosystems work.
- *Taking account of the dynamic nature and finite capacities of ecosystems.* Ecosystems are constantly changing (such as population fluctuations, plant succession, and seasonal changes). They have finite productive capacity and ability to absorb natural and human disturbances.
- *Encouraging collaboration among all those whose activities affect ecosystems.* Collaborative planning and integrated management are essential to the implementation of the ecosystem approach. As we use nature's bounty, we must be careful not to disrupt the fundamental functioning of ecosystems. In the long-run, what is left behind is more important than what we take.

The Ecosystem Approach

The ecosystem approach means:

- *Adopting an holistic view of the natural world.*
- *Recognizing complexity and interconnections.*
- *Taking account of the dynamic nature and finite capacities of ecosystems.*
- *Encouraging collaboration among all those whose activities affect ecosystems.*

An ecosystem approach has several advantages:

- We increase our chances of minimizing undesirable consequences of our actions on the environment.
- It forces us to recognize the potential for far-reaching effects of our actions.
- It encourages integrated, rather than sectoral or single purpose management, thus reducing conflicts which may arise when each resource sector is managed separately.

- It encourages long-term planning to sustain the productive capacities of ecosystems.
- It encourages the creation of decision-making processes based, not only on economic costs and benefits, but also on ecological and social costs and benefits.

Collaborative planning and integrated management are essential to the implementation of the ecosystem approach. As we use nature's bounty, we must be careful not to disrupt the fundamental functioning of ecosystems. In the long-run, what is left behind is more important than what we take.

While the ecosystem approach offers obvious advantages, incorporating it into current institutional structures, operational programs and legislation will take time, and will require commitment on the part of all concerned.

A Wild Life Policy

■ Currently, the Government of Ontario does not have a comprehensive wild life policy. Such a policy is necessary to meet future needs.

Strategy 3: Create a wild life policy for Ontario.

It is recommended that the policy include:

- Adoption of the definition of wild life proposed in this Strategy.
- Recognition of the need to sustain wild life populations and habitats.
- Recognition of the need to adopt an ecosystem approach to the management of resources.

Leadership

■ Implementing an ecosystem approach to wild life stewardship will require an unprecedented degree of collaboration and co-operation among ministries and public partners, as well as extensive integration of programs within the lead Ministry.

Strategy 4: Designate the Ministry of Natural Resources as the lead Ministry to assume responsibility for the stewardship of wild life.

Assuming leadership will require that the Ministry focus on a number of areas. First, it must nurture partnerships with non-government organizations, academic institutions and the public. Second, the Ministry must foster collaborative planning and operations among the divisions and branches responsible for the stewardship of wild life. Third, it must promote co-operation and collaboration with other Ministries (such as the Ministry of the Environment, the Ministry of Agriculture and Food, and the Ministry of Tourism and Recreation), agencies in the federal government (such as Environment Canada, Agriculture Canada, and Forestry Canada), and other provincial governments.

> *"Wild life management is generally regarded as the art and science of managing populations and habitats to meet the goals of society. In order to recommend such management actions as may be required, managers must draw on both theoretical and practical knowledge of the behaviour of populations and habitat requirements. But that is never enough. Much of the job is managing people and human impacts on the landscape, for that is where the real threat to biodiversity lies."*
> *(David Hussell, in a statement to the Working Group, 1991).*

Legislation

■ Effective stewardship requires a sound legislative foundation for policy and action. There are many provincial and federal laws relating to wild life (see page 38) but, for the most part, they are administered by different agencies responding to different mandates. This patchwork approach has discouraged integrated wild life management in the past. It was a source of concern to many people attending the Working Group and Ministry workshops.

Strategy 5: As a matter of urgency, the Ministry of Natural Resources should undertake, in co-operation with the appropriate ministries, non-government organizations and other relevant partners, a review of the adequacy of existing legislation relating to wild life, the protection of habitat, and consider the need for amendments and new legislation.

A critical problem is the lack of legislation designed to protect habitat or, at least, require serious consideration of habitat and wild life values in all development programs. The *Planning Act* has the potential to fulfil this function, but in its

present form and application, it is not effective. Other Acts, such as the *Drainage Act* and *Conservation Authorities Act,* were not designed to encourage an ecosystem approach to the management of land, water and habitat.

> *"Its just like the planet is a person sometimes it skins its knee and you fix it – but now it's dying and we have to operate quickly. We need a 911 for the environment."*
>
> *(Dustin Costescu, Grade 2, Stephen Leacock Public School, Kanata, Ontario. To a public hearing on the Federal Green Plan).*

Currently, there is no single piece of legislation which establishes responsibility for the stewardship of the flora and fauna of Ontario. The *Game and Fish Act* is outdated and should be replaced, and the *Endangered Species Act* is inadequate, especially with respect to habitat protection and enforcement. The Working Group heard from many sources that a *"Wild Life Act"* is needed. This suggestion arose because of a lack of comprehensive legislation and from dissatisfaction with the *Game and Fish* and the *Endangered Species Acts.* The Working Group agrees that new, comprehensive legislation is required, especially to deal with the protection of habitat and the retention of biodiversity; however, it seems unlikely that all requirements could be met by a single new act. For this reason it has recommended an urgent review of existing legislation and initiation of work on new legislation as needed.

Although the *Constitution Act* of 1867 gives the provinces the authority to make laws respecting property and civil rights, the Government of Ontario has not formally declared its ownership of wild life. Most other provinces have done so. The lack of a declaration of ownership by the Government of Ontario has resulted in problems for public and government agencies. For example, at present the *Game and Fish Act,* in conjunction with the application of common law, is interpreted in a manner which awards ownership of animals which have accidentally come into a person's possession. Because of this interpretation, Ministry staff cannot seize furbearing animals (such as lynx and fisher) claimed to have been accidentally caught by a trapper legally trapping for another species.

Wild life managers have no legal access to the parts (such as kidneys for analysis for cadmium and jaws for age determination) of legally-harvested animals. These parts are important to the successful completion of research and monitoring programs. In some instances, hunters and trappers have harvested animals of a sex and age they were not authorized to take, but such animals could not be claimed by the Crown and disposed of according to Ministry policy.

Strategy 6: The Government of Ontario take immediate steps to declare ownership of native wild life.

Provisions concerning the possession and disposition of wild life in captivity, rehabilitation of wild life, use of wild life, and the social and economic values of wild life are better understood as a logical consequence of the owner's regulatory requirements where the owner is the Province. Given this position, the private land owner has certain rights which must be observed, such as the right to deny access to naturalists, hunters, or other recreationalists and the right to hunt and trap on his or her own land.

It is also recommended that legislation protect the Crown from claims of liability and compensation for death, personal injury or property damage caused by wild life, or any wild life which escapes from captivity, or is abandoned. Further, the legislation should provide that no right of compensation exists against the Crown for expenses in connection with the rehabilitation of sick, injured, or orphaned animals unless the Crown agrees to pay such expenses. The principle of common law whereby animals found dead on private land belong to the owner should be modified by the declaration of the ownership of wild life, whether alive or dead; the animals should be acquired in accordance with the provisions of the legislation. In cases where animals escape or are intentionally released, responsibility for the capture of, and damage caused by, such animals should rest with the people responsible for causing the escape.

> *"In a peculiar way, it doesn't matter who is right any more. Success will lie in our ability to work together."*
> *(Artists' Response Team, Vancouver. Speaking at a Public Hearing on the Federal Green Plan).*

Examples of Legislation Relating to Wild Life

Legislation Relating to Habitat:

Aggregate Resources Act (Administered by the Ministry of Natural Resources)

Conservation Authorities Act (Administered by the Ministry of Natural Resources)

Conservation Lands Act (Administered by the Ministry of Natural Resources)

Crown Timber Act (Administered by the Ministry of Natural Resources)

Drainage Act (Administered by the Ministry of Agriculture and Food)

Environmental Assessment Act (Administered by the Ministry of the Environment)

Environmental Protection Act (Administered by the Ministry of the Environment)

Forestry Act (Administered by the Ministry of Natural Resources)

Game and Fish Act (Administered by the Ministry of Natural Resources)

Mining Act (Administered by the Ministry of Northern Development and Mines)

Niagara Escarpment Planning and Development Act (Administered by the Ministry of Municipal Affairs)

Ontario Heritage Foundation Act (Administered by the Ministry of Tourism and Recreation)

Ontario Planning and Development Act (Administered by the Ministry of Municipal Affairs)

Parks Assistance Act (Administered by the Ministry of Natural Resources)

Planning Act (Administered by the Ministry of Municipal Affairs)

Provincial Parks Act (Administered by the Ministry of Natural Resources)

Public Lands Act (Administered by the Ministry of Natural Resources)

Trees Act (Administered by the Ministry of Natural Resources)

Weed Control Act (Administered by the Ministry of Agriculture and Food)

Wilderness Areas Act (Administered by the Ministry of Natural Resources)

Woodlands Improvement Act (Administered by the Ministry of Natural Resources)

National Parks Act (Administered by the Government of Canada)

Indian Act (Administered by the Government of Canada)

Export and Imports Permit Act (Administered by the Government of Canada)

Legislation Relating to the Management of Wild Life:

Endangered Species Act (Administered by the Ministry of Natural Resources)
Game and Fish Act (Administered by the Ministry of Natural Resources)
Wolf Damage to Livestock Compensation Act, 1972 (Administered by the Ministry of Natural Resources)
Animal Disease and Protection Act (Administered by the Government of Canada)
Migratory Birds Convention Act (Administered by the Government of Canada)
Canada Wildlife Act (Administered by the Government of Canada)

Legislation Relating to the Use of Wild Life:

Fur Farms Act (Administered by the Ministry of Agriculture and Food)
Game and Fish Act (Administered by the Ministry of Natural Resources)
Hunter Damage Compensation Act (Administered by the Ministry of Agriculture and Food)
Ministry of Tourism and Recreation Act (Administered by the Ministry of Tourism and Recreation)
Municipal Act (Administered by the Ministry of Municipal Affairs)
Occupiers' Liability Act (Administered by the Ministry of the Attorney General)
Trespass to Property Act (Administered by the Ministry of the Attorney General)

Legislation Relating to Policy and Operations:

Ministry of Northern Affairs Act (Administered by the Ministry of Northern Development and Mines)
Ministry of Natural Resources Act (Administered by the Ministry of Natural Resources)
Municipal Act (Administered by the Ministry of Municipal Affairs)
Planning Act (Administered by the Ministry of Municipal Affairs)
Indian Act (Administered by the Government of Canada)
Wildlife Act (Administered by the Government of Canada)
Migratory Birds Convention Act (Administered by the Government of Canada)

BIODIVERSITY

> *"We can never restore Eden, but we may retain what remains of the old world, while making the imprint of our hand, where it must fall, bring beauty instead of blight, wholeness instead of necrosis and cancer. The method is to devote to the entire environment such care as the wisest might give to his own patrimony. The key is individual responsibility."*
> *(C.H.D. Clarke, 1964. A Philosophy of Conservation).*

An objective of this Strategy is the maintenance of an undiminished diversity of self-sustaining wild life populations. This is a demanding challenge. There are thousands of species in the Province and our knowledge of them is, with few exceptions, very limited or almost totally lacking. However, this problem is not unique to Ontario; scientists around the world, working on land, in fresh water, and in the oceans, are searching for ways to preserve biodiversity in the face of continuing threats to the survival of countless species. Habitat loss and degradation are the most serious threats to biodiversity, and are the primary causes of wild life extinction. Recognition of the importance of biodiversity and accelerating rates of extinctions and extirpations has stimulated research into causes and the development of new concepts which are being applied in the protection of biodiversity.

Habitat loss and degradation are the most serious threats to biodiversity, and are the primary causes of wild life extinction.

THE IMPORTANCE OF BIODIVERSITY

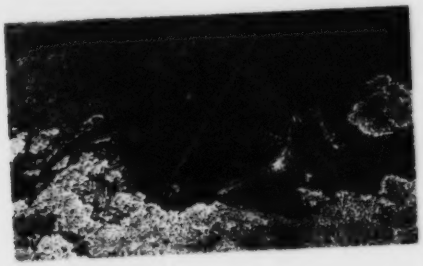
■ Maintaining biodiversity is important for several reasons:

- To keep all options open.
- To fulfil our obligation to future generations to pass on as complete a world as possible.
- To retain recognized and, as yet, undiscovered values and uses of wild life.
- To protect the known and hidden interconnections and dependencies which exist in ecosystems, especially with respect to maintaining the integrity of food-webs.
- To minimize the risk of destabilizing ecosystems through the loss of species or genetic diversity.
- To retain genetic diversity.
- To preserve the capacity of all species to evolve.

These mountain avens, near Cape Henrietta Maria, are part of Ontario's rich biodiversity. (Credit: Ross James)

MAINTAINING BIODIVERSITY

■ If our target is the maintenance of the present biodiversity of Ontario, it will be necessary to ensure that adequate habitat is available for all species and that populations are maintained at levels which will sustain them indefinitely. In cases where we remove portions of populations, the harvest must be conducted in a sustainable fashion to preserve the viability of the harvested population and other populations associated with it. For a population to be viable it must be large enough, be supported by sufficient, good quality habitat, and con-



Snapping turtle – a link in the food chains and biodiversity of wetlands. (Credit: Dave Fowle)

tain sufficient genetic diversity to cope with environmental stresses and new selection pressures over an indefinitely long period.

The minimum viable population size necessary to sustain a population varies from species to species and with habitat conditions. Isolated populations in fragmented habitats, on islands, or in protected areas surrounded by contrasting habitats, such as a wooded park surrounded by agricultural or urban landscapes, are known to suffer losses of animal species over time. These losses are the result of emigration, predation in the peripheral zone, and loss of genetic diversity as a consequence of random deaths or emigration of individuals carrying important inherited characteristics. Population changes brought about by these factors are in addition to the normal pressures, such as plant succession and random events like fires, outbreaks of disease and weather. In fact, there is evidence to suggest that there are no parks or reserves anywhere in the world large enough to ensure indefinite maintenance of some of the populations they are intended to protect.

For a population to be viable it must be large enough, be supported by sufficient good quality habitat, and contain sufficient genetic diversity to cope with environmental stresses and new selection pressures over an indefinitely long period.

Maintaining genetic diversity requires a viable population whose members may freely exchange genes in reproduction. This is most likely to occur when suitable habitats are large enough — contiguous or linked by corridors. It is known in some cases, and suspected in others, that populations may be comprised of subpopulations with different genetic constitutions. Some of these may be especially well adapted to local environments, say, to the more stressful conditions at the limits of the species' geographic range. If they are lost, they cannot readily be replaced by immigrants from other parts of the species' range or by introduction.

Species differ in their degree of genetic variation. For example, plants which thrive during the early stages of succession seem to have greater genetic diversity and, hence, tend to be better able to adapt to change than species which dominate during the later stages of succession. Self-fertilizing plants may be more vulnerable to extirpation than cross-pollinating species. Some species, such as the black duck, may not be able to resist competition with a hybridizing competitor like the mallard – the characteristics of one species, in this case the black duck, may therefore be gradually diluted.

Maintaining habitat in a diversity of landscapes and ecosystems is, of course, fundamentally important to maintaining species and genetic diversity. For this reason, managing for biodiversity requires an ecosystem approach.

MANAGING FOR BIODIVERSITY

■ Taking steps to ensure the maintenance of biodiversity will require reliable knowledge about ecosystem structure and function, a geographic framework for operations and the management of data and information, and improved monitoring, inventory, and protection of adequate samples of the ecosystems of the Province.

> *"Since 1600, some 113 species of birds and 83 species of mammals are known to have been lost. Between 1850 and 1950, the extinction rate of birds and mammals averaged one species per year. The rapid growth in the rate of species extinction is a telling measure of the status of the world's biodiversity."*
> *(Walter V. Reid and Kenton R. Miller, 1989. "Keeping Options Alive: The Scientific Basis for Conserving Biodiversity")*

■ ***Strategy 7: Enhance research and the flow of appropriate data and information from all sources as a basis for the maintenance and enhancement of biodiversity.***

The need for this type of data and information is not unique to Ontario. Other Canadian jurisdictions are struggling with many of the same questions. In view of the wide distribution of some ecosystems across Canada (such as tundra, boreal, mixedwood, urban, and agricultural landscapes), it is recommended that the prospects for co-operative research with other provincial, territorial, federal, academic and other research organizations across Canada be explored. Collaboration could make more efficient use of limited funding and scientific and technical personnel as well as serving the needs of several jurisdictions.

Potential topics include:

- Methods to determine minimum viable populations, especially for rare, threatened and endangered species.
- Determination of landscape unit or ecosystem boundaries.

Research

Research is an important component of wild life protection and management programs. In this picture, researchers test new ways of controlling rabies.
(Credit: Ministry of Natural Resources)

- The effects of habitat fragmentation on populations.
- Predator-prey interactions, with emphasis on the conservation of predators.
- The effects of disease and other mortality factors to determine which ones are critical.
- Behaviourial factors in population regulation.
- Habitat as a factor regulating populations.
- Monitoring techniques.
- Measures of ecosystem "health".
- Habitat requirements of selected species.
- Impact of climate change and acid precipitation.

A Geographic Basis for Management

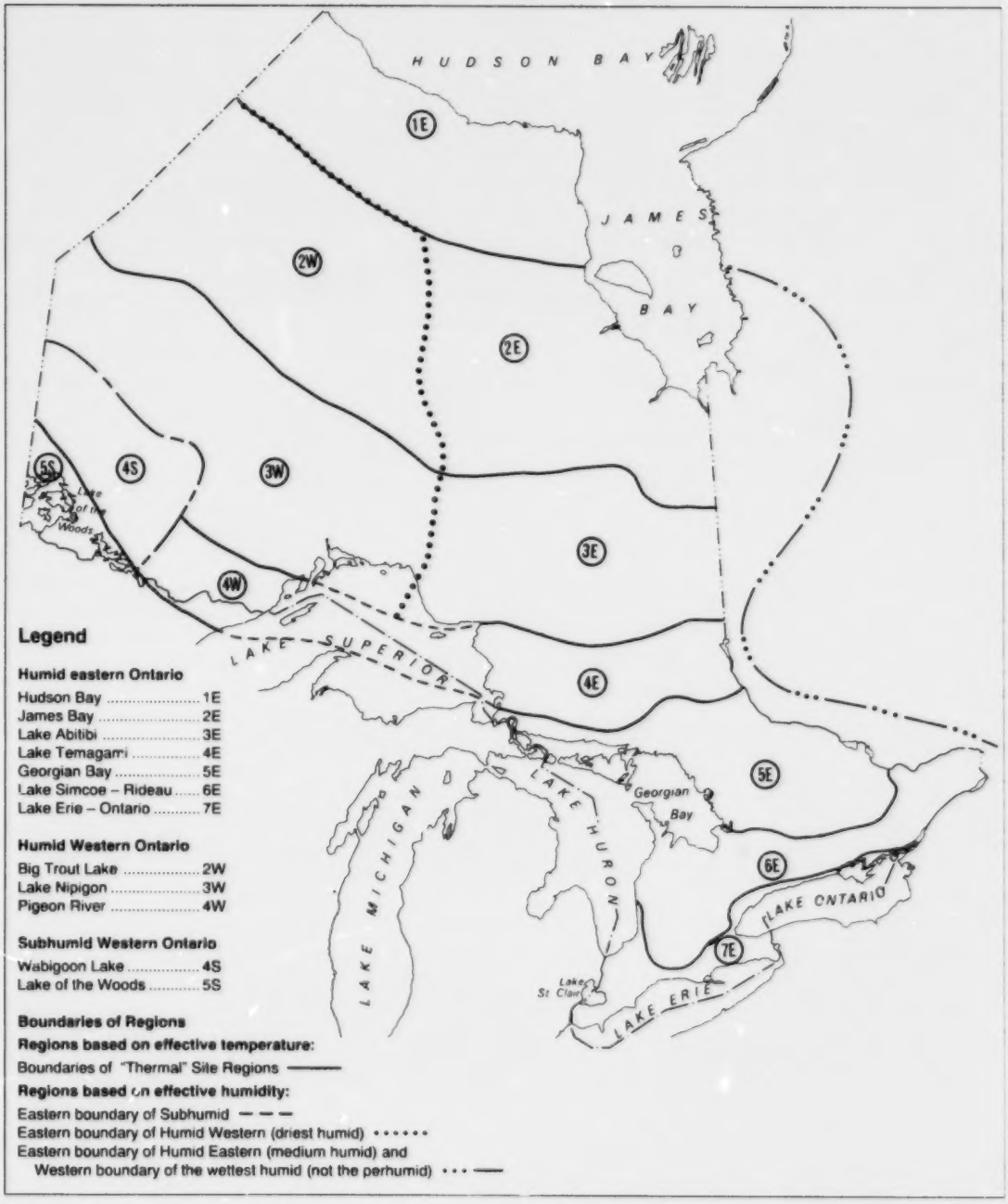
■ A means of ordering and arranging ecosystems on the basis of their similarities, differences, and relationships in some form of ecological land classification is required.

In the 1950s Angus Hills, of the Ontario Department of Lands and Forests, emerged as one of the founders of ecological classification in Canada. His work served as a catalyst to the development of other systems. Hills believed that climate and physiography exercise significant control over the distribution and productivity of forest ecosystems. He used his system to divide Ontario into geographical units with common physiographic and climatic features related to biotic features such as vegetation (see page 45).

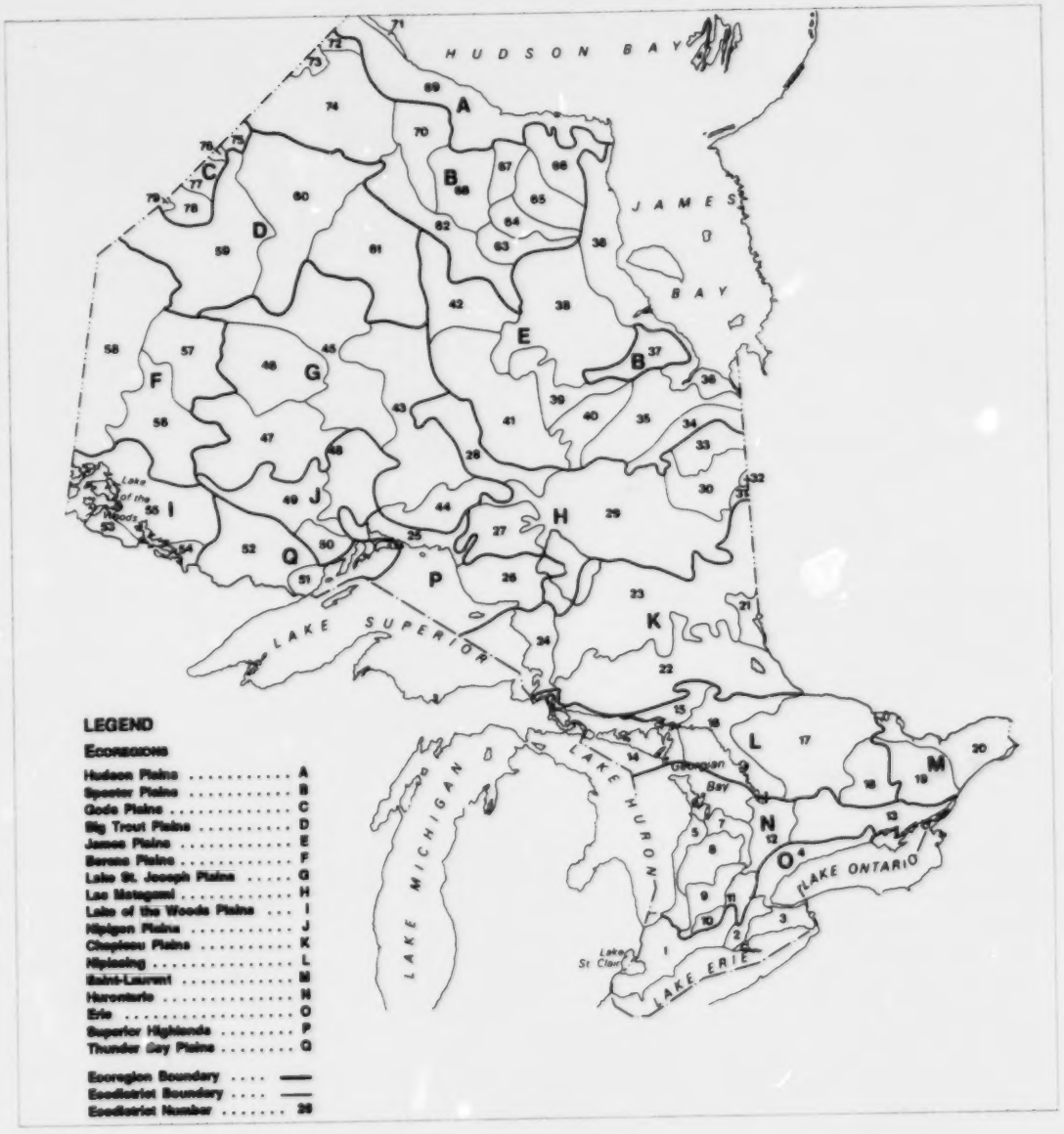
Hills' classification encompasses ecosystems ranging from the very small to the very large. The Forest Policy Branch (Ministry of Natural Resources) has employed his system as the basis for forest land classification. For example, a system developed recently for northwestern Ontario can be applied at the detailed "stand level" (such as small areas less than 10 hectares), and is based on climate, vegetation, and various soil properties. The Parks and Natural Heritage Policy Branch (Ministry of Natural Resources) also has developed policy and identified Areas of Natural and Scientific Interest (ANSIs) on the basis of the Hills classification system.

A national Ecological Land Classification (ELC) was developed in the 1960s by the Canada Committee on Ecological Land Classification. It incorporates many aspects of the Hills system in that homogeneous units of land are delineated on the basis of the most stable and dominant characteristics. It is also hierarchical, so that biological and physical data are synthesized into ecological land units at various map scales. There are seven levels in

Site Regions of Ontario delineated by Angus Hills. A Site Region is an area with characteristic climate (from Hills 1958).



There are seven levels in the Ecological Land Classification hierarchy: Ecozone, Ecoprovince, Ecoregion, Ecodistrict, Ecosection, Ecosite and Ecoelement. This map depicts the Ecoregions (characterized by distinctive ecological responses to climate as expressed by vegetation, soils, and water) and Ecodistricts (characterized by distinctive patterns of relief, geology, geomorphology, vegetation, soils, and water) (from Wickware and Rubec 1989).



the hierarchy; the largest units (ecozones, ecoprovinces, ecoregions, and ecodistricts), have been delineated for Ontario (see page 46).

Although the Hills and ELC systems are similar, there are some differences. For example, because the ELC system is a national system, it contains a number of broader levels (such as ecozone and ecoprovince). In contrast, Ministry foresters have traditionally worked at the more specific, detailed forest site level using Hills' classification. A single classification system is needed for Ontario.

Strategy 8: Adopt an ecological land classification system for Ontario.

The adoption of a multi-level (hierarchical) system by the Government of Ontario, would potentially provide a conceptual framework for organizing data and information relating to a variety of activities, including wild life, forestry, fisheries, tourism, socio-economic conditions, agriculture, protected lands, and general land use planning.

The Working Group suggests that representatives from current Ministry programs affected by adoption of an ecological classification system be assigned to a committee to advise on the variety of ecological, socio-economic, and geographical questions which will have to be addressed in developing a provincial system.

Information Management Systems

As the Ministry moves towards comprehensive resource management, it will be critical to the changing needs of managers to have relevant, high quality data and information organized in a responsive system. People attending the Class Environmental Assessment for Timber Management, and the workshops sponsored by the Working Group and the Ministry, suggested that the Ministry overhaul its current data and information systems. An ecosystem approach will require a flexible system containing data and information from various resource sectors, housed within an accessible, user-friendly operating system.

Strategy 9: Develop a data and information management system which is compatible and integrated with the ecological land classification framework.

The Working Group supports current Ministry initiatives to establish an integrated data and information management system, and recommends that the requirements for wild life protection and management be emphasized.

Monitoring and Inventory

■ ***Strategy 10: Establish an expert committee on monitoring to advise on the development of monitoring systems at provincial, regional and local levels.***

Required techniques include:

- Inventorying species and their distributions and habitat associations.
- Mapping data and information at various scales.
- Developing indices of abundance.
- Identifying rare, threatened and endangered species.
- Monitoring for immigrant and introduced species.

These are not new activities for the Ministry – inventories of forest and fisheries resources, some species of birds and mammals, and other wild life, have been undertaken for many years. However, increasing pressures on resources require that the Ministry undertake a wider range of monitoring with a greater degree of coordination and standardization to meet the needs of a geographically-based data management system.

This old field succession in Prince Edward County provides habitat for wild life. Inventory and monitoring of habitats are important to the ecosystem approach. (Credit: Ross James)

Strategy 11: Establish management unit boundaries based on an ecological land classification system, and collect the data and information necessary to set biodiversity objectives for each unit.

The implementation of this Strategy includes:

Using data from monitoring for :

- Listing and determining the distribution and habitat associations of all vertebrates, vascular plants, and other organisms of special concern (such as introduced species, hunted species, and rare, threatened or endangered species). As far as possible, the data and information should be used to determine various indices of biodiversity.
- Assessing the status of habitats with respect to the degree of alteration and fragmentation, and potential for rehabilitation. Use the information to detect trends and set management priorities.

Fostering the maintenance and enhancement of ecosystem diversity by:

- Striving to maintain landscapes/ecosystems in proportion to present distribution and in similar configurations.
- In managed forests, or in modified ecosystems, such as agricultural and urban lands, striving to maintain or create structural diversity and connecting corridors where necessary, in order to create a mosaic of diverse habitats.
- Addressing the needs of species requiring special attention or more intensive management (such as rare, threatened or endangered, and hunted animals), at a landscape scale which is smaller than the management unit.

We know little about the ecological significance to wild life species of the ecosystem boundaries used in both the Hills classification and the ELC classification. Research is needed on the relationships between ecological classification boundaries and wild life management.

Protection of Ecosystems

■ In Ontario there are five national parks (2,171 km^2), 261 provincial parks (63, 619 km^2), 37 provincial wilderness areas (618 km^2), 23 national wildlife areas and migratory bird sanctuaries (443 km^2), 45 provincial wildlife areas (9,240 km^2), and 324 other protected lands, including 15 Crown game preserves (8,091 km^2 in which habitat is not specifically protected but where animals are).

How do these areas contribute to the maintenance and/or enhancement of biodiversity in Ontario? How much wild life habitat should be included in protected areas? Do existing protected lands – many with artificial boundaries denoted by straight lines and right-angled corners – really include those samples of nature we wish to protect? Do the current protected lands adequately represent the ecosystems of Ontario?

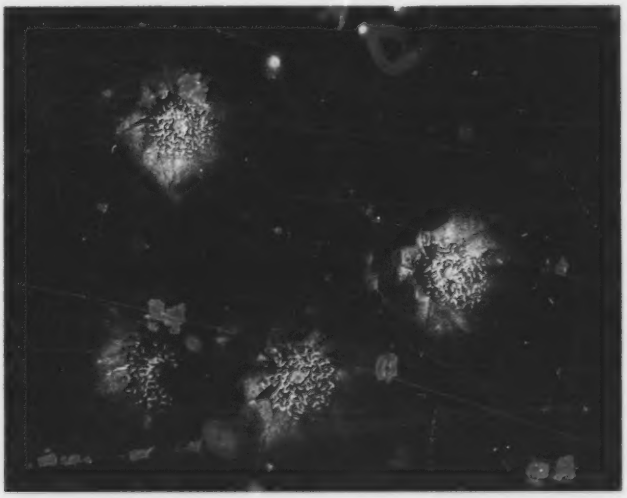
Do existing protected lands — many with artificial boundaries denoted by straight lines and right-angled corners — really include those samples of nature we wish to protect? Do the current protected lands adequately represent the ecosystems of Ontario?

Strategy 12: Ensure that Ontario has a system of protected areas which adequately represents ecosystems, landscapes and their wild life populations.

There is concern that the Ministry's present system of protected areas does not adequately represent Ontario's ecosystems, because it is not clearly defined. Therefore, implementation of this Strategy will require a comprehensive review of the existing protected areas program. The review should include an assessment of all protected areas in the Province such as provincial and federal parks, ANSIs, conservation authority lands, provincial and national wildlife areas, migratory bird sanctuaries and crown game preserves. This assessment should be followed up with a program to address deficiencies.

This Strategy might be implemented by the appointment of a "Protected Lands Task Force."

Ideally, the lands and waters which are given protection should be selected so that in total they represent the major ecosystems and landscapes in Ontario, and are of sufficient size and configuration to provide the desired protection. However, because we do not have the data and information necessary to make such a selection, we must do the best we can. One approach is to set a general target for the total area to be protected at a scale which would provide a reasonable likelihood that the most important ecosystems and sites of special interest would be included. This should be done on the basis of two considerations: first, the degree to which the total selection of lands truly represents all the ecosystems, and, second, that there be enough duplication in the system to allow for losses to fires, insect pests and other destructive agents, including climate change.



The most significant threat to southern Ontario species, such as this prickly pear cactus, is the alteration and destruction of habitat. (Credit: Ross James)

Rare Species: Any indigenous species of fauna or flora that is represented in Ontario by small, but relatively stable, populations, and/or that should be monitored periodically for evidence of a possible decline.

Threatened Species: Any indigenous species of fauna or flora that, on the basis of the best available scientific evidence, is indicated to be experiencing a definite non-cyclical decline throughout all or a major portion of its Ontario range, and that is likely to become an endangered species if the factors responsible for the decline continue unabated.

Endangered Species: Any indigenous species of fauna or flora that, on the basis of the best available scientific evidence, is indicated to be threatened with immediate extinction throughout all or a significant portion of its Ontario range.

The Special Case of Rare, Threatened and Endangered Species

■ The protection and management of rare, threatened and endangered species offers a special challenge in a program to maintain biodiversity. About 10 species of animals and 40 plants are thought to have been extirpated from Ontario since European colonization. Some, such as the once-plentiful passenger pigeon, have been extirpated from their entire ranges. Others, such as the Atlantic salmon and timber rattlesnake, have been eliminated from Ontario, but survive elsewhere.

At present, approximately 25 animal and 190 plant species have been recognized as threatened. Some species may have always been rare, but others certainly existed in much greater numbers and in more vigorous populations before European colonization. Still others now exist in very low numbers as seriously depleted populations, or occur only in remnant and specialized natural habitats isolated by distance and human land use from other populations of their species.

Non-native diseases have decimated the populations of some species such as the American elm which has fallen victim to Dutch elm disease. There is evidence that some small local populations of plants have declined as a result of collecting. While the extinction of many native species as a result of competition from introduced non-native species has been significant in other parts of the world, it has not yet appeared as a major problem in Ontario. However, time and future research may prove otherwise.

At present, approximately 25 animal and 190 plant species have been recognized as threatened.

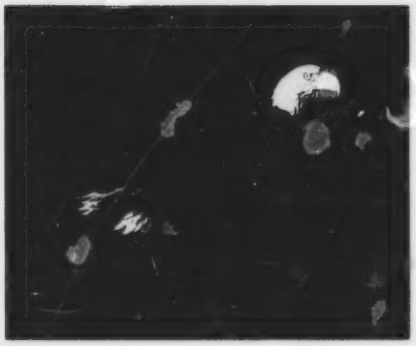
The most significant threat has been, and continues to be, the alteration and destruction of habitat. While there has not yet been any marked loss of species diversity in major landscapes in northern Ontario, the correlation of extirpation with major human occupation is undeniable. The loss of native species and habitats has been most pronounced in southern Ontario, where it continues today.

The Working Group supports the national strategy for the recovery of endangered species (Recovery of Nationally Endangered Wildlife – RENEW) and is pleased that Ontario is a RENEW member. But generally, Ontario's Rare, Threatened and Endangered Species Program is inadequate. At present, it is a minor component of the Ministry's Wildlife Program and has been hampered by a lack of commitment and funding.

The *Endangered Species Act* (1977) now regulates 19 species, including several which are extirpated from Ontario. Adding to and deleting from the existing list has proved to be a very slow process. The legislation is used only rarely because of a heavy onus on proving that contraventions are wilful.

While there has not yet been any marked loss of species diversity in major landscapes in northern Ontario, the correlation of extirpation with major human occupation is undeniable.

No provincial policy has been developed for rare, threatened or endangered species, although more than one hundred species have been designated by the Ministry's Fisheries and Wildlife Policy Branches as meeting the criteria. Nor has policy pursuant to the *Planning Act* been developed to foster a regard for the protection of these species in land use planning. Some of the strongest Ministry statements are in the Southern Ontario Co-ordinated Program Strategy (1982). For example, it states that "the Ministry will conduct its activities in an environmentally responsible manner", and will "identify and protect the habitat of provincially rare and endangered animals and plants". However, these statements have no associated program targets and are not considered to be explicit policy statements.



Atlases documenting distribution of habitats and species, such as this bald eagle, are valuable in planning protection and management programs.
(Credit: Ministry of Natural Resources)

The initiative of non-government organizations, academics, museums and volunteer professionals, with financial and other assistance from the provincial and federal governments, has produced an outstanding knowledge base of the distribution and status of some plants and animals through atlasing projects. They are also developing partnerships supporting recovery programs for targeted spe-

cies. They have created a more receptive and credible environment for applying rare species data to land use planning in general, so much so that documentation of the occurrence of rare species is now regularly considered in private development proposals.

The rapid increase in atlasing and synoptic surveys has coincided with the development of new data management capabilities, such as The Nature Conservancy's Biological and Conservation Data program, which is now supplying some data on the status and distribution of species. Ministry offices now regularly receive requests for information on rare, threatened and endangered species from consultants, public agencies, utilities and others. The requests are not restricted to species regulated under the *Endangered Species Act,* but include information on species variously termed "provincially significant", "provincially rare", "species of concern", and "regionally rare".

Strategy 13: Develop a policy on rare, threatened and endangered species.

To assist in the development of a policy, the Ministry should establish an Advisory Committee on Rare, Threatened and Endangered Species to include professional and academic experts, naturalists and government staff members, to advise the Minister on the development and management of a program that would have responsibility for wild life falling within these definitions.

Several weaknesses have been identified in the Endangered Species Act.

Legislation and policy must be strengthened. The *Endangered Species Act,* the *Game and Fish Act,* and the *Federal Fisheries Act* are key pieces of legislation that protect rare, threatened and endangered species in Ontario. Several weaknesses have been identified in the *Endangered Species Act.* For example: its preamble does not require endangered species to be identified, or recovery to be undertaken where appropriate; lack of protection for habitat; the need to demonstrate wilful intent; the lack of prohibition or regulation of possession, propagation, trade or transport; and, regulation of accredited scientific research. To address these shortcomings, the *Endangered Species Act* should be amended, or replaced.

In much of Ontario, land use planning is regulated by the *Planning Act,* which calls on municipalities to have regard for policy statements under that *Act.* This planning principle has been used in relation to wetlands and Areas of Natural and Scientific Interest but has not been implemented in the case of rare, threatened and endangered species. However, in the absence of policy under the *Planning Act,* Ministry policy or guidelines,

although not as effective as actions under the *Planning Act,* can be important tools enabling appropriate interventions in land use planning.

The Advisory Committee should review and advise government on needed amendments to existing legislation or new legislation as well as policies, and on methods for enhancing and developing partnerships with non-government organizations and other agencies to ensure the maintenance of present inventories, atlases and data management systems. The Committee also should recommend ways to streamline the procedure for designating species requiring special protection.

In addition, it should examine the definitions of the various categories of vulnerability, the rationale for their protection and the appropriate application of the *Endangered Species Act* to protect rare, threatened and endangered species, other species of conservation concern, and habitats. Consideration should also be given to developing a statement of policy for rare, threatened and endangered species under the *Planning Act,* in conjunction with other Ministry initiatives to develop such policies.

CUMULATIVE IMPACTS

Secure breeding habitat is essential to maintaining populations – red-winged black birds in a cattail marsh.
(Credit: Dave Fowle)

■ Cumulative change results from successive, often small, impacts of our actions on the environment where natural processes cannot dissipate these impacts. The loss or degradation of wetlands is an example of the insidious effects of cumu-

lative impacts. Requests for amendments to municipal "official" plans to permit development are reviewed by the appropriate agencies for potential impacts. Where wetlands are involved, the Ministry of Natural Resources and conservation authorities base their comments on each specific proposal, and generally do not relate it to previous or potential future developments and their associated impacts. The result is an accumulation of changes, no one of which in itself is unacceptable, but collectively they may account for a serious loss of wetlands and wetland functions.

Other examples include the overall change brought about by the gradual development of cottage communities around lakes and in recreational areas, the spread of suburban development across the urban fringe, and the increase in estate housing in rural and remnant natural areas. These examples illustrate the importance of building the concept of cumulative impacts into monitoring, planning and approval processes.

Strategy 14: Include detection of cumulative impacts in monitoring programs and require assessment of potential cumulative effects in planning and approval procedures.

Cumulative change results from successive, often small, impacts of our actions on the environment where natural processes cannot dissipate these impacts.

The Working Group recommends that cumulative impact research be completed to measure the effects of certain land use activities, and consider multiple causes and the relationships among these causes. Currently formal research and management programs do not exist, and are not funded with the express objective of identifying and mitigating cumulative impacts. The Ministry might review existing knowledge of the effects of cumulative impacts on Ontario's ecosystems, and consult with the federal government and other provincial and territorial agencies currently engaged in cumulative impact studies as steps toward design and implementation of a cumulative impact research program.

Climate Change

■ At the World Climate Conference in Geneva in 1990, some of the world's leading scientists affirmed that a change in global climate is imminent. Anticipated changes in Ontario could have profound effects on wild life habitat in the Province over the next one hundred years (see pages 58 and 59).

A drier climate may result in a change in the distribution and importance of many wetlands. If lake and river levels decline, some wetlands will be lost and others will be created; shoreline wetlands may become isolated inland. Changes such as these may result in the redistribution of waterfowl, shorebirds, aquatic furbearers, moose, and many other species.

Predictions call for Ontario's climate to grow hotter and drier and winters to be warmer, with a consequent reduction in seasonal differences. The effects of climate change on wild life may include the following:

- A drier climate may result in a change in the distribution and importance of many wetlands. If lake and river levels decline, some wetlands will be lost and others will be created; shoreline wetlands may become isolated inland. Changes such as these may result in the redistribution of waterfowl, shorebirds, aquatic furbearers, moose and many other species.
- Southern species which are currently at the northern edge of their range and rare in Ontario may expand their range and become more common. Northern species may be lost as a result of range shrinkage. The drier climate may provide suitable habitat for the migration of western prairie species eastward.
- Agriculture may expand significantly in northern Ontario and cause significant change to wild life habitat.
- The forest ecosystems of Ontario will likely change, as will silvicultural strategies. Both are important to wild life.
- Some ecological reserves, parks and other protected areas may change to the extent that their original purpose is no longer served.
- There will be a reduction in biodiversity in some areas and an increase in others.
- Changes to most activities related to wild life (such as viewing, hiking, boating, and hunting and trapping) will occur, resulting in significant socio-economic impact.

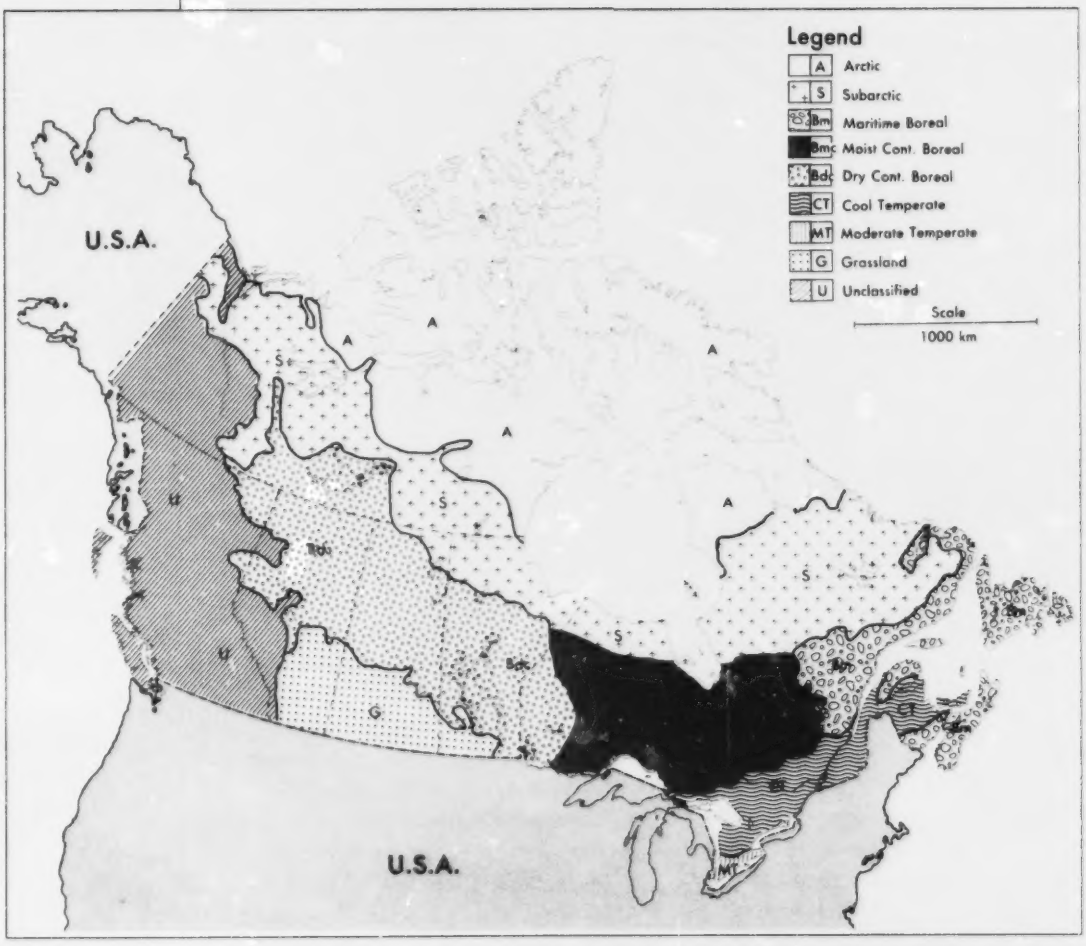
All long-term planning in Ontario must take account of these anticipated changes. International and national discussions of possible responses are underway, and models projecting possible changes are being developed for Canada and other countries.

Strategy 15: Take account of the most up-to-date data and information on climate change and predicted effects on all long-term planning, inventory and monitoring programs for habitat and populations.

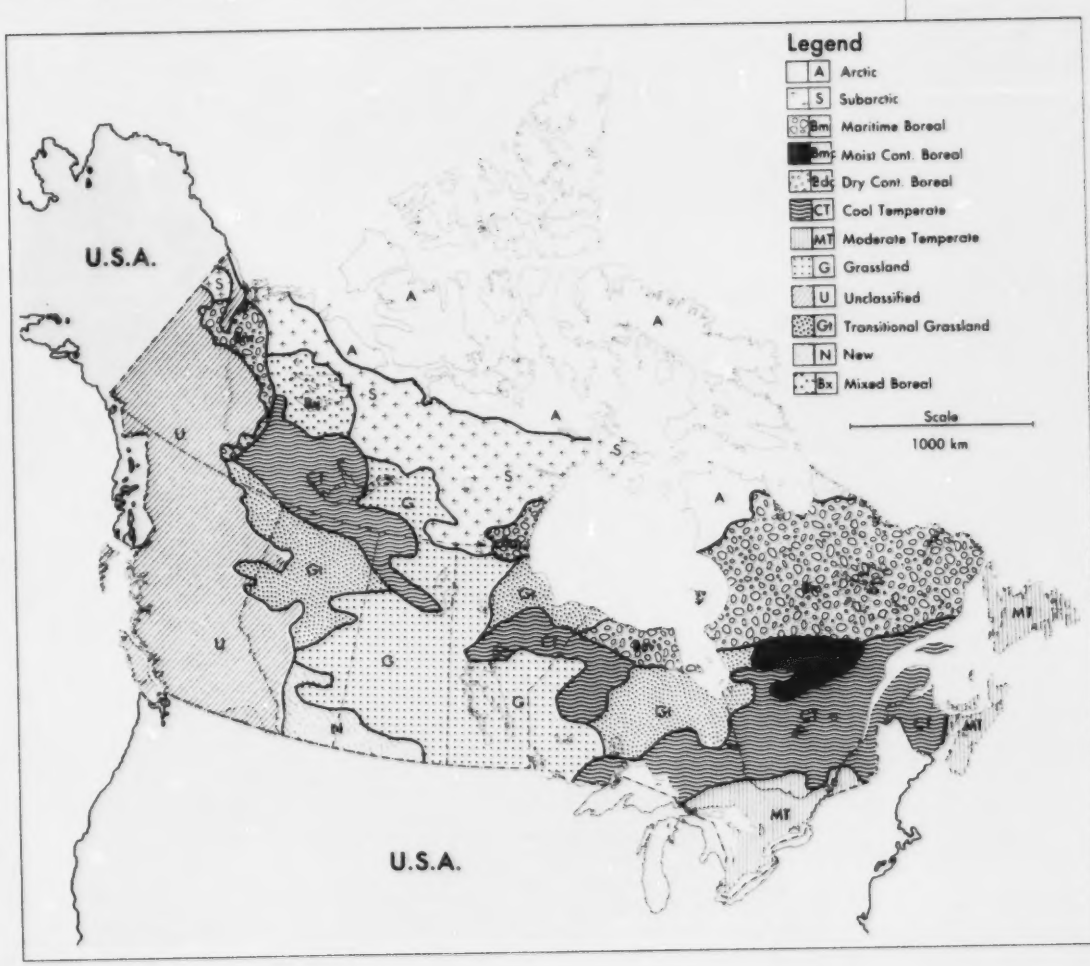
The Ministry should be an active participant in provincial activities designed to address the consequences of climate change. There may be opportunities for collaborative research on the effects of climate change on habitat, populations and socio-economic factors relating to wild life.

Comprehensive monitoring to detect the impacts of climate change will probably be carried out at the national level. For that purpose, long-term monitoring sites which are totally, or relatively, free of human disturbance will be important. Protected areas such as nature reserves would be good candidates. Measures of change will be needed. The use of indicator species and habitats as measures of change should be explored.

A map of the current Ecoclimatic Provinces of Canada, which expresses regional climate through the development of vegetation and soils. If climate changes over time, we should be able to anticipate and predict related changes to vegetation and soils (from Rizzo 1988).



This map depicts predicted Ecoclimatic Provinces of Canada based on climatic change resulting from a doubling of carbon dioxide in the atmosphere. There are significant transformations affecting the location of Canada's ecosystems. For example, in Ontario the Moist Continental Boreal Ecoclimatic Province depicted in Figure 19 will disappear and be replaced by the Transitional Grassland, Grassland, and the Cool Temperate Ecoclimatic Provinces. These predictive models suggest that if climatic change progresses unchecked, there will be substantial effects on our key sustainable resources, such as forests, wild life, agricultural lands and recreational areas (from Rizzo 1988).



Habitat

A Place for Everything...

In March of 1859, Charles Darwin concluded "The Origin of Species" with this paragraph:

> *"It is interesting to contemplate a tangled bank, clothed with many plants of many kinds, with birds singing on the bushes, with various insects flitting about, and with worms crawling through the damp earth, and to reflect that these elaborately constructed forms, so different from each other, and dependent upon each other in so complex a manner, have all been produced by laws acting around us. These laws, taken in the largest sense, being Growth and Reproduction; Inheritance which is almost implied by reproduction; Variability from direct and indirect action of the conditions of life, and from use and disuse: a Ratio of Increase so high as to lead to a Struggle for Life, and as a consequence to Natural Selection, entailing Divergence of Character and Extinction of less-improved forms. Thus, from the war of nature, from famine and death, the most exalted object which we are capable of conceiving, namely, the production of higher animals, directly follows. There is a grandeur in this view of life, with its several powers, having been originally breathed by the Creator into a few forms or into one; and that, whilst this planet has gone cycling on according to the fixed law of gravity, from so simple a beginning endless forms most beautiful and most wonderful have been, and are being evolved."*

Darwin was the seminal figure who began to unravel the mysteries of biodiversity. It was he who first explored how it might be that all "living beings", as he called them, survived by finding their own special niche – nature seemingly has a place for everything.

Darwin displayed extraordinary insight when he described his "tangled bank" and encapsulated the central themes of modern ecology in one paragraph: complex interconnections and dependence, the importance of conserving and exchanging genetic inheritance, and the flow of change and evolution.

We, the stewards of wild life for our generation, must care for the "tangled bank" with all its components, from the smallest micro-organism to the largest mammal and tree. We will never recover the conditions of the past, but by placing high priority on the protection, rehabilitation, and management of habitat, we can strive to ensure that there will be a place for everything.

We must strive to ensure that there will be a place for everything. (Credit: Ross James)

Habitat: is "home". It is the soil, the water, the air, the rocks, the rain, the heat, and the other plants and animals which combine in an infinite number of ways to provide the food, the water, and the space needed for wild life to survive. If there is no habitat, there is no wild life. And it is continuously changing in response to fire, flood, weather, new species, population fluctuations, outbreaks of disease, many other natural events, and human disturbance. All species have different habitats, and when we view them collectively, we speak of ecosystem structure and function.

Inherent in the goal of this Strategy is the need to address the question of how much habitat is required.
(Credit: Paul Gray)

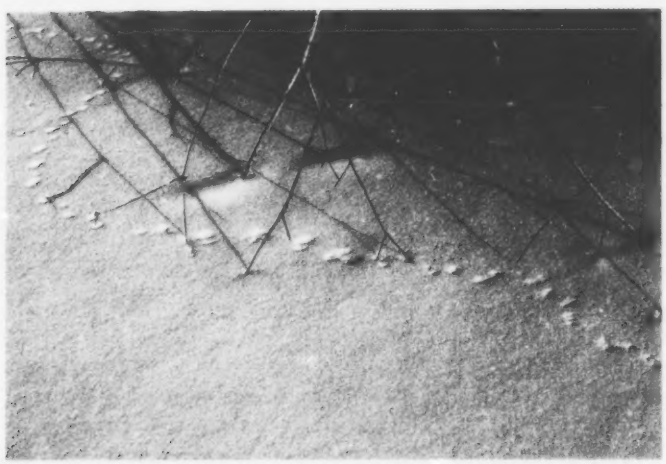
■ In the general sense, "habitat" means the place where plants, animals and other organisms live; it is their home. Specifically, it means that combination of living and non-living things associated with a particular species, which together provide it with the resources it needs to complete its life-cycle. Thus, we can speak of wild life habitat as meaning all the various environments in which wild life is found. Or, we can speak of specific habitats such as oak habitat, meaning places favoured by oaks, or pileated woodpecker habitat, or moose habitat as distinct from deer habitat or woodland caribou habitat. Thus habitat can vary all the way from a small, specific site such as the interior of a flower essential for an insect or a mite to the large area occupied by a pack of timber wolves or a black bear.

If we are to continue to have a diversity of wild life, we must ensure the exist-

ence of a diversity of habitats to accommodate the needs of all species. Inherent in the goal of this Strategy is the need to address the question of how much habitat is required, how much diversity, and what kinds and quality of populations are to be sustained. One of the questions that must be answered is whether the present level of biodiversity is what we wish to retain or whether we wish to restore that of some previous time.

If we are to continue to have a diversity of wild life we must ensure the existence of a diversity of habitats to accommodate the needs of all species.

Inherent in the goal of this Strategy is the need to address how much diversity is to be sustained. (Credit: Paul Gray)



Given current lifestyles, attitudes, lack of legislation to protect habitat, and anticipated population growth, with all the associated demands on natural resources, maintaining current levels of biodiversity will be impossible unless we change our ways. Clearly, the people of Ontario face daunting decisions – they must decide what they want and the means by which they will achieve it. Maintaining current levels of biodiversity will require sacrifice and changes in attitude. Although the Working Group detected strong desire for change, it is not convinced that Ontarians understand the scope and magnitude of the change that will have to occur to meet biodiversity objectives for the Province. For example, decisions to maintain current levels of biodiversity in parts of the Province may require enforcement of a "limited growth" policy in some urban centres, or the exclusion of certain types of industry, resulting in significant economic loss to a community. Are the people of Ontario prepared to say "no" to economic expansion in some areas?

HABITAT INVENTORY AND MONITORING

■ Habitat change can be detrimental to some species and beneficial to others. However, some human impacts, such as intensive agriculture, drainage of wetlands, and urban development, lead to elimination and fragmentation of habitats. Some are replaced with less complex and less stable ecosystems, characterized by reduced biodiversity. For example, some habitats have been degraded to the extent that only the most opportunistic species such as rats, starlings and cockroaches are the dominant life forms

In order to provide effective habitat protection and management, there must be a means of measuring the success of programs — monitoring change is one technique. In the past, success has often been measured in terms of change in population levels and species diversity. But because habitat is a primary factor determining the distribution and abundance of populations and species diversity, it is reasonable to suggest that it, too, can be monitored and used as a measure of the success of management and protection programs. Studies in the United States suggest that a combination of techniques can be used to monitor ecosystems: low risk or abundant species can be monitored with habitat indices, while high-risk species (such as rare, threatened and endangered species) can be monitored with population indices or a combination of population and habitat indices.

Clearly, the people of Ontario face daunting decisions – they must decide what they want and the means by which they will achieve it.

Many plants such as this showy lady's-slipper, are especially valued for their flowers.
(Credit: Dave Fowle)

Strategy 16: Upgrade and continue to develop wild life habitat inventory and monitoring programs.

Keeping track of habitat change requires a spatial and temporal framework within which to manage data and information. Through inventory and monitoring we can establish benchmarks against which change can be measured and objectives for management established. For this, we need to specify clearly and comprehensively the minimum requirements for data and information.

A logical extension of the ecological land classification system is the development of a wild life habitat atlas. Atlasing is a valuable management tool with which data and information can be stored, updated, accessed, and manipulated quickly by computer. The databases can be enhanced, as surveys are completed, according to a standard format and a geographical reference system. Data and information can be stored and expressed as text, tables and maps. Wild life atlases are also excellent educational tools.

The Working Group recommends that the Ministry study the feasibility of developing and maintaining a habitat atlas for Ontario using a GIS-based system. In the past decade, many significant technological advancements were made in applying remotely-sensed data to monitoring and inventorying habitat. The Working Group recommends the Ministry move as quickly as possible to use such technology in wild life programs.

HABITAT ON PUBLIC LANDS

■ There are two major types of public lands: Crown lands which have never been sold or have been re-acquired by the Crown are the most extensive. They are held by the provincial and federal governments. Other public lands include municipal lands, or lands held by agencies such as the Niagara Parks Commission, the St. Lawrence Parks Commission, and conservation authorities. More than 87 per cent of the total area of Ontario is Crown land, and most is located in the north. Public land in the south, although generally divided into small parcels, is particularly valuable since it is often located near highly urbanized and agricultural areas where the original landscapes have been greatly modified and because

it is on productive soils. Collectively, they constitute a large and diverse assemblage of habitats, managed by a number of techniques in relation to the goals and objectives of the various agencies responsible for them, but their full potential to function as wild life habitat has not been realized. Land management programs need to be co-ordinated wherever possible in ways that optimize their use as wild life habitat.

Crown land management is carried out in the context of the Ministry's land use and resource management planning system. Through land use planning, program objectives are identified, while targets are confirmed at the local level. Objectives and targets are integrated into resource management decisions and programs. Resource management planning is then completed under the auspices of the District Land Use Guidelines to identify and implement decisions about the use of Crown lands.

Strategy 17: Improve the management of public lands for their wild life values.

Land management programs need to be co-ordinated wherever possible in ways that optimize their use as wild life habitat.

Public lands, such as this deciduous forest, are important to the future of Ontario's wild life and people. (Credit: Ross James)

Presently the Ministry's planning procedures provide for wild life and habitat within a framework of "featured species" management, including identification and protection of specific habitat characteristics. The Working Group recognizes the practical advantages of this approach but does not consider it conducive to an ecosystem approach or to the maintenance of biodiversity, and therefore recommends that it be re-evaluated. The Government must ensure that wild life values are an important part of the valuation of Ontario's Crown lands. With the exception of provincial wildlife areas, migratory bird sanctuaries, and national wildlife areas, few public lands are managed primarily for habitat, although protection and management programs provide, coincidentally, for it.

The Working Group recommends that the Ministry continue to develop and strengthen an ecosystem approach to the management and protection of Crown lands so that all interests are represented in the planning phase and reflected in decisions about their use and disposition. In addition, wild life values should be explicitly recognized in legislation, policies, and programs.

As we begin to deal with a broader range of wild life values within a mix of diverse, and possibly conflicting, proposals for the use of Crown and other public lands, a high degree of co-operation among the concerned agencies and the public will be necessary. Important aspects of the process will be: establishment of common goals and objectives, joint participation in the planning and management processes, improved knowledge and communication, and an appreciation of societal values relating to wild life.

Crown Game Preserves

■ Crown game preserves were first established about 70 years ago to protect wild life populations – largely by prohibiting hunting and trapping except under conditions prescribed by the Lieutenant Governor-in-Council. Apparently the intent was to maintain or enhance stocks of wild life in these areas with the expectation that they would emigrate to surrounding areas and re-supply depleted populations. However, no provision was made to protect and manage habitat.

Since their creation, preserves have been used in several ways, including as "reservoirs" from which animals have been relocated to other areas, as a "buffer" to separate a prison farm from the hunting public, as a means of restricting hunting and trapping opportunities, as an artillery range, for camping, picnick-

ing, swimming, hiking, collection of fish spawn, wild life viewing, wild life research, as a scout camp, as a junior ranger camp, as a national park, as a provincial park, and for cottage development, urban development, agriculture, mining, and logging.

A total of 121 preserves were originally established, but since 1960 most have been rescinded. Now only 15 remain – four in the north and 11 in the south. The northern preserves comprise 97 per cent of the total land area of all preserves. With the exception of the Peterborough Crown Game Preserve, which encompasses approximately 152 km^2, the remaining 10 in the south are each less than 25 km^2 in size.

Decisions to rescind or retain preserves were based on: evolving land management strategies, knowledge of the ecological importance of the preserve, and the possibility of alternative wild life management programs (such as registered traplines and selective moose and deer harvest). Some preserves were eventually included within provincial parks, some were deemed ecologically insignificant, while others were consumed by urban development.

The administration of the preserves has sometimes been difficult. For most, their role in maintaining habitat and populations is unclear. In at least one, deer populations were claimed to have increased beyond the capacity of the habitat to support them in good health. Management, particularly in the south, is complicated by the fact that many preserves are comprised of a patchwork of private and public lands on which a variety of activities such as logging, mining, agriculture and other developments are permitted.

The administration of the preserves has sometimes been difficult. For most, their role in maintaining habitat and populations is unclear.

They have turned out not to be "preserves" in the true sense of the word. Nor have they, except to a limited extent, fulfilled the function for which they were set aside. Nevertheless, some, such as the Chapleau, Nipissing and Peterborough Preserves, include large segments of Ontario landscapes and support a diversity of wild life.

The future disposition of crown game preserves should be determined as part of the comprehensive review of protected areas in Ontario (see Strategy 12). The Working Group recommends that all preserves be examined in detail with emphasis on:

- An inventory and evaluation of the state of existing habitat and wild life populations.
- An evaluation of the suitability of these areas to contribute to objectives associated with a comprehensive protected areas system.

- Future disposition of preserves, which may include:
  - removing crown game preserves from any further consideration in the wild life program,
  - changing their status and designation (such as a provincial park), or
  - maintaining the preserve and its designation.

URBAN DEVELOPMENT

Urban development eliminates or significantly modifies wild life habitat. (Credit: Dave Fowle)

> *"If we attempt to stand in the way of development, our efforts will assuredly be of no avail either to stop development or promote conservation. It will not, however, be hard to show that the best and most highly economic development and exploitation in the interests of the people can only take place by having regard to the principles of conservation."*
> *(Clifford Sifton, Chairman, Commission of Conservation at its first annual meeting in Ottawa, January, 1910).*

■ There is little doubt about the concern for a clean, healthy environment, particularly in urban areas. "Green spaces", natural areas, wild plants and animals are all part of the common perception of a quality urban environment. The recent reports of the Crombie Royal Commission on the Future of the Toronto Waterfront and the Kanter study, "Space for All: Options for a Greater Toronto Area Greenlands Strategy", are explicit about the need for an ecosystem approach to land use planning and management in which wild life is a key component. Both reports identify a number of existing tools which, if applied in a co-ordinated manner, would result in considerable improvement in natural resource protection and management in urban areas.

Although urban wild life comprises a small part of the total biodiversity of the Province, 80 per cent of our people live in towns and cities of more than 10,000. More than 70 per cent of urban people (about 4-5 million) participate in activities related to wild life such as photography, feeding, and observation. In spite of this, very little attention is given to the needs of urban wild life or to the needs of the people who may wish to have access to it close to their homes.

An urban wild life program is needed in Ontario. (Credit: Dave Fowle)

An Urban Wild Life Program

■ A provincial urban wild life program, supported by local, regional, and provincial governments, is needed. A recent survey of North American wild life agencies, sponsored by the Ministry of Natural Resources, showed that most of them recognized the importance of urban wild life programs, but their development and implementation have been stalled frequently because of a lack of funding and commitment. At present, only nine North American wild life agencies have designated urban wild life programs, while 20 other agencies address urban programs as part of their so-called "non-game" programs. Ontario does not have a formal urban wild life program.

In spite of the lack of a formal program, the Ministry and other agencies have been active in urban areas. A recent survey (completed by Ministry staff) of 17 Ministry administrative districts showed that all of them deliver the education program, Project WILD, in urban areas. Half of them have urban "Community Wild Life Involvement Program" (CWIP) projects, many of which are devoted to improving habitat. Several districts organize urban viewing days. Some have completed inventories of colonial

There is little doubt about the concern for a clean, healthy environment, particularly in urban areas. "Green spaces", natural areas, wild plants and animals are all parts of the common perception of a quality urban environment.

birds within the boundaries of urban areas. Some have engaged in active wild life habitat management projects. All provide input into planning activities, on request.

Strategy 18: Develop and implement an urban wild life program for Ontario.

The key to success of an urban wild life program will be the provision and care of habitat.

An urban wild life program should be a partnership program of broad scope to include the maintenance of biodiversity, involvement in rehabilitation of injured and orphaned animals, and control of nuisance animals and diseases which threaten domestic animals and public health. There should be a strong educational component included in parks programs, urban school curricula and rehabilitation centre programs.

The Ministry should participate in partnerships with local authorities, particularly in habitat management programs for "greenspace", and in urban planning at the official plan and site plan levels. There are many opportunities for collaboration among municipalities, provincial government ministries, conservation authorities and private corporations.

The key to the success of an urban wild life program will be the provision and care of habitat.

The Impact of Urban Development

■ Many municipal official plans in Ontario make reference to the preservation of open space where "nature" may be included as a component. Few have policies addressing preservation and rehabilitation of habitat, such as natural woodlands, within an ecosystem framework. In some municipalities, the designation "open space" also serves to reduce the tax burden on the landowner until such time as an amendment to the official plan is requested in support of a development program.

Urban development can destroy or alter habitat. Conversion of land for housing, streets, and commercial and industrial facilities have obvious and generally severe, but largely unavoidable, impacts. The development of recreational facilities such as marinas, golf courses, playing fields and ski facilities may provide desirable open space but eliminate or reduce wild life habitat. The impacts of gradually expanding urban areas tend to be cumulative and, hence, may be overlooked until it is too late to recover sufficient green space for wild life.

Strategy 19: Mitigate the impacts of development on wild life habitat.

The Working Group believes that forward-looking urban greenspace strategies are required to address wild life habitat explicitly. The Ministry can assist by ensuring that consideration is given to habitat in planning and assessment, and the construction and maintenance phases of developments which will impact habitat.

The Ontario Round Table's "Challenge Paper" supports this approach in calling for the identification and protection of areas of special natural and scientific interest, environmentally sensitive areas, river valleys, headwaters, wetlands, recharge areas, and other unique ecosystems in, and adjacent to, urban centres. Legislation and associated regulations need to be reviewed and where appropriate amended. For example, the "Fill, Construction and Alterations to Waterways Regulations" administered by the conservation authorities could be strengthened to provide greater emphasis on wild life habitat. The *Trees Act* could be amended to provide additional controls over the cutting of trees on urban lands.

Standards relating to the amount of land which must be dedicated to greenspace should be examined. For example, current standards require 5 per cent for residential lands and 2 per cent for commercial and industrial lands. Do these standards work within an ecosystem framework? To this end, regional and provincial agencies could assist the municipalities in examining proposed development plans within an ecosystem context, especially to identify cumulative impacts.

Greenspace can be acquired through purchase or lease agreement. But these are not the only, or most desirable, means which can be used in urban areas. In many cases the high cost of land may be prohibitive. Other measures are needed that call on landowners to participate in wild life habitat stewardship programs.

WETLANDS

Wetlands have significant ecological, cultural, and socio-economic values.

■ In its recent "Challenge Paper", the Ontario Round Table on Environment and Economy reminded us that "water is an essential life-sustaining resource..." and that a "healthy system of wetlands is critical...".

Wetlands have significant ecological, cultural, and socio-economic values. They serve as natural filters, water storage and flood control areas, nutrient recyclers, wild life habitat, and provide numerous recreational opportunities. They are important to agriculture, forestry, industry, communities, the recreation industry, and they are home to a greater diversity of wild life than any other habitat type in Ontario. For example, more than 40 bird species are entirely dependent on them, while 16 species of mammals and 20 reptile and amphibian species are partially (or completely) dependent on wetlands. A large number of plants are unique to wetlands.

More than 70 per cent of the wetlands in the south have already been

Wetlands serve as natural filters, water storage and flood control areas, nutrient recyclers, and wild life habitat, and provide many recreational opportunities. (Credit: Ross James)

The Ministry's wetland classification system: contains 7 Classes, each of which represents a point spread (rating or score) based on biological, social, hydrological, and special feature components. Wetlands which score high in all components are designated provincially significant and are allocated to Class 1 or 2. Regionally significant wetlands are placed in Class 3, while the remaining, less significant, wetlands are assigned to Classes 4-7.

destroyed and land use pressures continue to increase. It is time to get tough. The Working Group strongly believes that limited action to protect remaining wetlands now will severely compromise remaining water resources in southern Ontario, which will have substantial impact on the very resource sectors which rely on the water in the first place. The Working Group supports current efforts by the Ministry to develop a policy which calls for a no loss of wetland function of Class 1, 2, and 3 wetlands in southern Ontario.

Strategy 20: Ensure no loss of wetland function of Class 1, 2, and 3 wetlands.

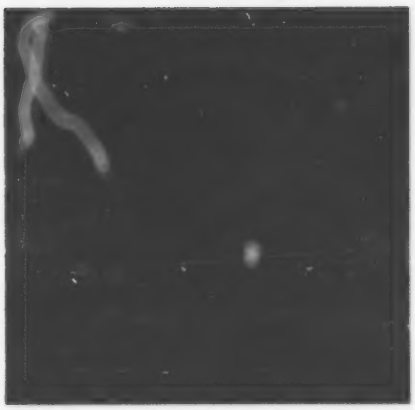
In support of this policy, the Government of Ontario should change its current approach respecting onus of proof. If a "no loss of wetland function" policy is to be successfully enforced, proponents for development, including government, must demonstrate that there is no loss of function as a consequence of development.

The Wildlife Working Group recommends that the Government of Ontario complete a comprehensive wetlands protection and management plan. To this end, a Wetlands Task Force, comprised of representatives from government, industry, non-government organizations, academic institutions, and the general public, should be appointed to advise on the completion of a comprehensive wetlands protection and management plan for Ontario.

More than 70 per cent of the wetlands in the south have already been destroyed and land use pressures continue to increase. It is time to get tough.

The Task Force should begin by assessing the adequacy of the current inventory, evaluation, and classification systems used in Ontario because of questions about the adequacy of the current classification system and the criteria used to assign wetlands to a class. This must be resolved as soon as possible.

The Task Force should also assess the effectiveness of current education and extension programs which focus on, or contain elements of, wetlands and their management to ensure that the message about the need to protect wetlands is reaching the appropriate audiences. There is a need for research in a number of areas, including techniques for restoration, enhancement, and identification of socio-economic, cultural, and ecological



A comprehensive wetlands protection and management plan is needed. (Credit: Peter Smith)

values. This could be completed in concert with programs established to value and institute full-cost pricing for water in Ontario. Finally, the Task Force should advise on the development of practical and effective legislation, regulations and policies to ensure that valued wetlands are protected.

Despite significant loss of wetlands in southern Ontario, the province continues to be one of the most freshwater-rich jurisdictions in the world. The province is blessed with more than 260,000 lakes. In northern Ontario, peatlands cover a collective area of 24 million hectares – most of it in the Hudson Bay Lowland. This is the largest semi-continuous wetland area in the northern hemisphere. It supports a rich flora, and provides habitat for three species of loons, tundra swans, three species of geese, four species of ducks which breed nowhere else in Ontario, sandhill cranes, willow ptarmigan, about a dozen species of shorebirds and an equal number of other bird species which generally occur nowhere else in Ontario. In addition, woodland caribou and a variety of other mammals inhabit the region. It is clearly a habitat of great significance to the wild life of this province.

The province is blessed with more than 260,000 lakes. In northern Ontario peatlands cover a collective area of 24 million hectares – most of it in the Hudson Bay Lowland.

Strategy 21: Evaluate the ecological significance of wetlands in northern Ontario.

There has been no comprehensive inventory and evaluation of wetlands in northern Ontario comparable to that undertaken in the south. The Working Group recommends that a survey procedure for northern wetlands be established so that the Ministry can respond to land use proposals and associated issues.

HABITAT ON AGRICULTURAL LAND

■ Ontario farmers, as stewards of land, can play an important role in the future of wild life. Farmlands are located in the most favourable climatic zones and on the most productive soils in the Province; their natural productivity and carrying capacity is high. Natural vegetation on farmlands, especially woodlots and wetlands, not only contributes to the biodiversity of the Province, but to the amenity of the countryside. Some agricultural lands include areas of special interest, such as habitats of rare, threatened and endangered species or offer special viewing opportunities.

The most extensive, long-term modification of wild life habitat has occurred on farmlands – particularly in southwestern Ontario, where the original forests and wetlands are nearly all gone. In other areas the removal of the original or second-growth forest is not as extensive, and substantial numbers of woodlots and wetlands remain scattered among the farms.

Farmers face many obstacles during the course of a year. Their crops are susceptible to unpredictable – often devastating – weather conditions. They must control pests and diseases in crops and livestock. Wild life such as white-tailed deer, coyotes, mice, woodchucks, rabbits, geese, robins, starlings, gulls, and black bears damage crops or destroy livestock. Naturalists, hunters, hikers, and trappers are often interested in gaining access to farmland, and the farmer is faced with decisions concerning trespass, safety, property damage, and liability.

Ontario farmers, as stewards of land, can play an important role in the future of wild life (Credit: Ministry of Natural Resources)

Historically, the Ministry has not emphasized wild life management on farmlands. The following strategies are proposed to encourage more activity in this area.

Strategy 22: Maintain wild life habitat diversity on agricultural lands in a manner compatible with agricultural practice.

Farmers face many obstacles during the course of a year. Their crops are susceptible to unpredictable – often devastating – weather conditions. They must control pests and diseases in crops and livestock. Wild life such as white-tailed deer, coyotes, mice, woodchucks, rabbits, geese, robins, starlings, gulls, and black bears, damage crops or destroy livestock.

Strategy 23: Co-operate in the rehabilitation of wild life habitat on agricultural lands in a manner compatible with agricultural practice.

The primary question is: how can Ontario farmers be encouraged to retain and enhance wild life values associated with agricultural land? The Working Group believes the Ministry must provide leadership in fostering collaboration among appropriate farm organizations, government agencies, and non-government organizations in the promotion of practices which are beneficial to wild life and the protection and rehabilitation of habitat, especially in relation to land drainage and the protection of forested lands.

Provincial committees could co-ordinate the implementation of programs involving farmers, all levels of government, and non-government organizations. The Working Group supports efforts like the "Wild Life Extension Landowner Agreement Areas" program, and encourages the Government of Ontario to employ them wherever possible. In addition, sportsmen's groups and naturalists' clubs should be encouraged to work with the agricultural community on habitat projects.

There are a number of mechanisms which can be employed to assist farmers in the stewardship of wild life in ways which are compatible with agricultural practice. Program options include legislative review, and where appropriate, revision of land assessment and taxation programs to encourage the protection of wetlands and forested land. Efforts by the Ontario Heritage Foundation to develop an improved system of long-term conservation easements for wild life habitat are an important development. Provincial and federal governments might examine agricultural support programs with the objectives of maximizing conservation programs, including wild life.

The Government of Ontario should ensure that legislation, regulations, and policies administered by the various agencies are co-ordinated in ways which promote habitat management on agricultural lands. For example, the Ministry might improve techniques which could be applied under the auspices of the *"Woodlands Improvement Act"*. In re-

There are a number of mechanisms which can be employed to assist farmers in the stewardship of wild life in ways which are compatible with agricultural practice. (Credit: Ross James)

cent years advances in landscape ecology have suggested some ways for managing the shape, size, and distribution of habitats, such as woodlots, travel corridor hedgerows and streamside vegetation which might be usefully applied in Ontario.

Other desirable actions include:

- Promotion of co-ordinated wetlands research and information exchange across Canada by the Federal-Provincial Committee on Land Use.
- Inventory of potential wild life habitat on agricultural land in southern Ontario.
- Enhancement of agricultural extension programs to encourage stewardship of wild life and include a larger component of information on wild life values and habitat management, especially in relation to wetlands, stream valleys and forested land.
- Resolution of problems relating to wild life/agriculture conflicts as soon as possible through information and amendment of legislation as necessary.

FOREST MANAGEMENT

■ When Champlain arrived, nearly all wild life species lived in the forest that covered most of what is now Ontario. Despite many years of land clearing in the south and timber harvesting in the north, more than 800,000 km^2 of forest remain, ranging from original stands to those now in their third or fourth generation. Forests are obviously the most extensive type of habitat in the Province.

Our forests have played an important role in the evolution and development of Ontarian society. During the nineteenth century, forests provided work for an expanding labour force, economic stability, home for wild life, and wood for domes-

How can the forests be managed and protected in a way which ensures an acceptable mix of ecological, cultural, social and economic benefits?

tic use. In this century, it is still a major contributor to the provincial economy (about 20 million cubic metres from over 200,000 hectares annually), but now we have grown to appreciate its ecological significance, and there is widespread recognition of the diverse benefits forests provide.

How can the forests be managed and protected in a way which ensures an acceptable mix of ecological, cultural, social and economic benefits?

Logging, silviculture, fire and the effects of disease and insects, such as the spruce budworm, together shape the mosaic of forest landscapes in Ontario. Logging and wild fire have a dual impact on forest habitats; both simultaneously destroy and create habitat. Loss in one area may be countered by a regenerating stand elsewhere, but there are situations where logging may have long-term or permanent effects on wild life. Woodland caribou, for example, require large areas of old-growth forest. Clear cutting in conjunction with increased access can lead to their disappearance. On the other hand, certain types of new habitat created by cutting will result in increased moose reproduction, survival, and population densities.

While we may anticipate fairly confidently the response of moose populations to a specific disturbance such as logging, we cannot speak with the same confidence about logging and its impact on thousands of other species which inhabit the forest. We need much more data and information on the impact of logging and fire on ecosystems. If we are to provide for forest wild life, we must continue to develop harvesting and silvicultural strategies and techniques. Like logging, wild fire and prescribed fire destroy and create habitat simultaneously. Prescribed burning has considerable potential as a management tool, but the application of both natural and controlled fire requires more research. Although prescribed burning has been successfully employed to create and/or maintain habitat for selected species (such as Kirtland's warbler and moose) in some jurisdictions in North America, most studies of fire have focused on fire behaviour and silviculture, not wild life habitat.

The relationship between forestry operations and wild life has been the subject of much discussion in recent years, especially in relation to the Class Environmental Assessment for Timber Management and its public hearings. The effect of the hearings has been to greatly heighten government and public awareness of some of the environmental issues in forestry. They have also provided opportunities for non-government organi-

zations to air their views on present and future practices.

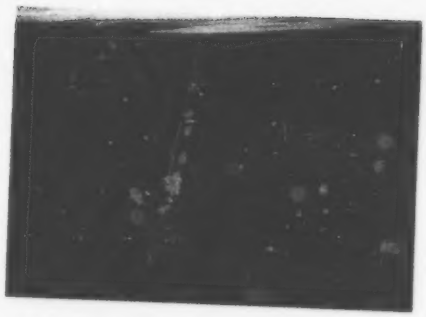
The Working Group heard some of these views at the workshops and during other consultations. Many people expressed the concern that present practices devote too much attention to wood and fibre production and not enough to wild life and other forest values.

Fuller integration of wild life and habitat needs with forest management practices are expected. Moreover, many people expect that a major effort must be made to maintain present habitat and, where feasible, to restore biodiversity in degraded ecosystems. In proposing the following strategies, the Working Group recognizes that many of the technical aspects of forest management in the future will be affected by the report of the Environmental Assessment Board. The Working Group will, therefore, limit its recommendations to broad strategic issues.

Strategy 24: Maintain wild life habitat diversity on forest lands.

Strategy 25: Rehabilitate degraded wild life habitat on forest lands.

Integrated planning, which must account for all forest values, is a principal step in the ecosystem approach to forest management. It should involve all the stakeholders, including the public, and may require some subsidies to facilitate the participation of private individuals and non-government organizations.



Logging has a dual impact on forest habitats — it simultaneously destroys and creates them.
(Credit: Nina Pileggi)

Management for biodiversity requires the maintenance of habitat diversity. In forests not disturbed by humans, diversity is maintained by plant succession, fire, the destruction of vegetation by insects and fungi, and by occasional wind storms. In managed forests, these processes continue but may be modified by human intervention to control pests and fire and to impose deliberately a desired mosaic of successional stages and age distribution through cutting and silvicultural programs, controlled burning, use of herbicides, and construction of roads or developments related to other forest values.

Where enough information is available on species composition and age distribution of the vegetation, it is possible to model future patterns of diversity and indirectly estimate the carrying capacity for some animals, or to determine targets for the amounts of habitat required to support a given number of animals.

Like logging, fire also destroys and creates habitats. (Credit: Ministry of Natural Resources)

The development of management programs along these lines requires that data and information be current. In addition, government must be willing to undertake the necessary integrated planning and management at a much greater scale than is now practised. Progress in this direction could be encouraged by bringing government staff responsible for forest management together with industry and other forest users to develop comprehensive programs leading to the stewardship of forests – the programs must account for all values, including wild life and habitat. There is a need to better inform those concerned about the welfare and future of our forests, especially to close the gap between perception and the reality of forestry practices as they affect wild life.

On private land, owners of wooded areas should be encouraged with economic and other incentives to care for the forests and wetlands. Rehabilitation ac-

tivities could include the planting of corridors to connect patches of habitat which have become isolated.

More research will be needed to implement these programs. Some examples are:

- Use of prescribed burning in habitat management.
- Impacts of logging and fire on habitat.
- Long-term impacts of silvicultural practices on succession and habitat.

Integrated planning, which must account for all forest values, is a principal step in the ecosystem approach to forest management.

- Importance of shape, size and distribution of habitat to wild life populations.
- Greater awareness of landowner attitudes and the economics of private land management on the part of governments and non-government organizations.

Some Aspects of Wild Life Populations

Dynamics Of Animal Populations

The popular concept of "the balance of nature" recognizes that the plants and animals in an ecosystem are dependent on, and interact with, each other and their physical environment. The notion that this balance is a static equilibrium, however, is incorrect. The semblance of balance is really the result of a dynamic equilibrium, which may be disrupted by massive changes followed by the establishment of a new equilibrium. The "balance" is therefore tenuous, for most wild life populations exist in an almost continuous state of imbalance.

The size of a population depends primarily on the changing balance of births and deaths, and secondarily on immigration and emigration. While the conditions which ensure healthy populations are not always obvious or well understood, some facts and principles do seem to apply widely to plants and animals, from the smallest to the largest.

Garter snakes are harmless, beautiful and interesting animals. (Credit: Ross James)

Habitat is the "home" which provides for the needs of a species. Some habitats may be "optimal" and provide for a thriving population, while others may be "marginal", barely sufficient to support a population. Thus, health and condition depend on the quality of the habitat which, in turn, influences reproductive success. In addition, condition and reproductive success may be affected by the density of the population: animals in sparse populations in optimal habitat are usually healthier and produce more surviving offspring than those in dense populations. In high density populations the food supply is often inadequate, animals are in poor condition, subject to the stresses of competition of social interactions, reproduction is low, and animals may starve or be vulnerable to disease and predation.

Wild animals die from many causes: starvation, disease, exposure, accidents, predation and human activities such as hunting and trapping. Natural patterns of mortality vary widely among species. The pattern for humans in some industrialized societies – low child and adult mortality with many individuals approaching maximum potential longevity – is rare among wild animals. The common pattern in wild populations is a high to moderate rate of juvenile mortality followed by a steady loss of adults so that only a few reach old age. Mortality patterns may vary within species: dense populations tend to have higher death rates, mainly from malnutrition and disease, than do sparse populations.

Life spans vary widely. Black bears may reach an age of 25 years but few small birds or rodents live beyond five years, and most die at a much earlier age. Long-lived animals tend to have lower reproductive rates than short-lived ones, and therefore, they take longer to recover from population reductions. In contrast, short-lived animals have a high population turnover and a tremendous capacity for quick recovery from population crashes.

Understanding the population dynamics of many wild life species, like this groundhog, is important to ecosystem management. (Credit: Ross James)

The tendency for reproductive rates to decrease and mortality rates to increase as population density increases, leads to the concept of carrying capacity — the idea that there is a maximum population size which can be supported by any given habitat. Carrying capacity may be determined by food supply or by some other resource that is in limited supply, such as shelter or nesting sites, or by mortality factors such as predation.

At carrying capacity, production of young is roughly equal to mortality, but is below the potential maximum output. Maximum production of young occurs at a lower population level, usually at about half of carrying capacity. This is the population level which produces "maximum sustained yield", the level at which individuals can continue to be removed indefinitely without reducing productivity. Maintaining populations at this level is advantageous if the species is to be harvested by humans because the animals are in good condition, the food resource is unlikely to be impaired and productivity is maximized over the long-term. This is also a favourable condition for predators since they can take prey without the hazard of large fluctuations in their food supply.

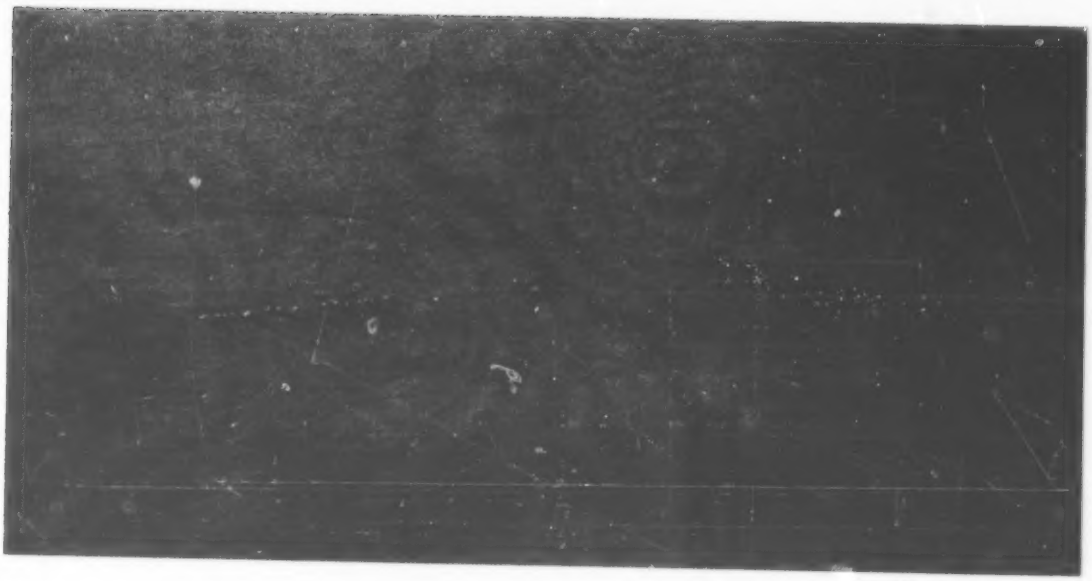
Populations of many land animals fluctuate enormously, especially in boreal forest habitats. Highs and lows tend to occur fairly regularly for particular species, such as small mammals which rise and fall every three to five years, while snowshoe hares, ruffed grouse and their predators, lynx and goshawks, reach high levels every nine to ten years. The causes of these fluctuations are not well understood, but they are probably influenced by changes in food supply and predation on reproduction and mortality.

In Ontario, populations of some small forest birds increase greatly when there is a major outbreak of spruce budworm, for example. There have been three outbreaks in this century and they must have had a tremendous impact on habitats and populations. Fire, spruce budworm and plant diseases are the main natural factors responsible for the mosaic of plant communities and succession of habitats across the Boreal Forest landscape. These large-scale factors may temporarily increase or decrease carrying capacity by creating or destroying habitat. Other large-scale factors such as a series of exceptionally cold winters or dry summers, can have major effects on populations and habitat as well. In addition, human activities such as logging, agriculture and urban development have resulted in huge changes in carrying capacities.

WILD LIFE POPULATIONS

■ Maintaining healthy wild life populations to ensure their continued existence in a changing and increasingly demanding world will involve careful consideration of many factors which may have profound impacts on them, and in understanding much more about wild life population dynamics, species interactions and responses to human manipulations.

POPULATION INVENTORY AND MONITORING



■ In order to ensure a continuing diversity of species in the Province, and to apply management actions effectively, it is necessary to know what species we have, their abundance in various habitats, and how they respond to management and environmental changes. Inventory and monitoring are important tools in this regard.

The Ministry has a long and successful record of inventory and monitoring programs for some selected species. It must continue these programs but extend them to additional species.

Strategy 26: Develop and continue to upgrade wild life population inventory and monitoring programs.

Inventorying and monitoring all wild life species is impossible. The Ministry must determine the most appropriate species as well as clear and comprehensive minimum information specifications and incorporate the data into the data management systems advocated earlier in this Strategy.

The Ministry has a long and successful record of inventory and monitoring programs for some species, such as the woodland caribou. (Credit: Paul Gray)

WILD LIFE HEALTH: PARASITES AND DISEASES IN ANIMALS

■ All populations of wild animals in Ontario are infected with parasites and diseases but few appear to be a serious threat to long-term population viability, although they may have substantial impact on local populations from time to time. In general, we tend to notice their impact only when there are widespread die-offs or there is a risk to the health of domestic animals or people.

❑ ***Parasites and diseases can be significant in reducing local populations, especially where there are high densities of infected animals. For example, the Alfred Bog moose herd in eastern Ontario was reduced by 75 per cent in 1978 and 1979 by infestations of winter ticks.***

Many of the common parasites and diseases encountered by people in wild animals cannot be transmitted to humans or domestic animals. There are, however, some that are transmissible: tularaemia, giardiasis, Powassan disease, baylisascariasis, rabies, and Lyme disease. Lyme disease in particular, is gaining widespread notoriety since the known incidence of human cases has increased significantly in recent years.

❑ ***Die-offs of waterfowl occur in Ontario from botulism or other diseases (such as Sphaeridiotrema in Lake Superior in 1990).***

Rabies is also a threat to public health. It arrived in northern Ontario, presumably in Arctic foxes in 1954, and later became endemic throughout the agricultural south. About 800 - 4200 Ontario citizens receive the anti-rabies vaccine each year after confirmed or suspected exposure to rabid animals. In total, the cost of managing rabies exceeds 20 million dollars annually.

Most problems caused by diseases and parasites in wild animals are difficult or impossible to manage, expensive to address, and may be beset by controversy, such as the tuberculosis and brucellosis controversy in bison of Wood Buffalo National Park. With better planning and monitoring, some problems can be avoided. Strategies are needed to prevent outbreaks of potentially serious diseases, which will likely require enhancement of current resources.

Strategy 27: Improve monitoring of diseases and parasites.

Increased emphasis should be placed on diagnostic surveillance (monitoring) programs for commonly occurring diseases and diseases transmissible from wild animals to people. In addition, there is need to improve communication about wild animal health with the public, among Ministry staff, and specialized groups, such as wild life rehabilitators.

Responsibility for the management of diseases of wild life is divided between federal and provincial governments. For example, while the federal government is responsible for co-ordinating the management and control of rabies in domes-

tic animals, the Ministry of Natural Resources is responsible for management of the disease in wild animals, and the Ministry of Health for management of the disease in people. Within Ontario, Lyme disease in humans is managed by the Ministry of Health and in wild animals by the Ministry of Natural Resources.

Some concern centres around diseased animals, either domestic or wild, which are transported and held in Ontario facilities, such as game farms where, in some instances, brucellosis and tuberculosis have been found. These diseases pose a major threat to the marketability of Ontario livestock, and could have a devastating impact on Ontario agriculture. This would be compounded if either of these diseases were established in wild populations – they could be recycled back to domestic animals.

As long as the game farming industry exists in Ontario, the Working Group recommends that the Ministry play a prominent role in the management of diseases and parasites at these facilities. The Ministry should work co-operatively with other provincial and federal agencies to develop policies and programs, especially with respect to the regulation and monitoring of diseases transmissible from animals in captivity to free-ranging wild life.

Strategy 28: Ensure effective disease and parasite program planning and management.

Given the complexity of the problems, and the number of agencies involved in disease and parasite management and research, the Working Group believes that inter-provincial, national, and international collaboration should be encouraged. Measures should be taken to improve the co-ordination of management of parasites and diseases, including the establishment of research and monitoring priorities, co-operative control programs, and education and extension programs.

Throughout the world, most wild animal health research has concentrated on the study of one stressor, or a very limited combination of potential disease and parasite stressors on individuals and populations. While this approach has value, it does not provide the best information about the actual functioning of

Monitoring for debilitating diseases and parasites in foxes and other animals is important.
(Credit: Ross James)

❑ ***Soon after the introduction of Alberta elk (wapiti) into Ontario in the 1930s, it was discovered that the animals were infected with the liver fluke, Fascioloides magna, which was being transmitted to bison and domestic sheep in various parts of Ontario. As a consequence, in 1949 the Ontario Department of Lands and Forests slaughtered several elk herds. This is an example of a problem associated with introductions which could have been avoided by checking for parasites prior to the introduction.***

❑ ***Diseases may also influence the distribution of wild life. There is evidence that the brain worm (meningeal worm) of deer which kills moose, limits high-density populations of moose and deer living together. In the Kenora, Rainy River, and Algonquin regions, for example, moose have flourished only when deer densities were depressed.***

stressors in the wild since they most often work in combination. For example, toxicological studies have tended to attribute reductions in population numbers to the effects of various toxins – they ignore the impacts of parasites and diseases and other factors such as habitat. More interdisciplinary research is required which addresses interactions among health stressors.

INTRODUCTIONS INTO THE WILD

Wild Life Introduction: is the relocation of wild life species (or subspecies) from outside the Province or within the Province from ecological units (such as ecoregions and ecodistricts) where they occur naturally to ecological units where they are not present.

■ Animals and plants have been deliberately introduced into the wild for a variety of reasons:

- To enhance opportunities for hunting (such as ring-necked pheasant and the Hungarian partridge).
- To retain cultural attachments to the wild life of the "home countries" of people who have settled in North America.
- To restore species to parts of their former range (such as the wild turkey

which was re-established in Ontario during the 1980s).

- To control indigenous or introduced pests (such as introductions of insect predators and parasites).
- To satisfy the innate propensity of humans to "tinker with nature" (for example, some Canadian gardeners attempt to cultivate southern species in northern climates).

Many introductions have occurred inadvertently, sometimes with disastrous results. Domestic and international travel and trade have contributed to introductions such as termites, weeds, and the zebra mussel. Other species, such as the gypsy moth, have been "assisted" in spreading by way of egg masses and cocoons attached to recreational vehicles. Opossums are thought to have spread to Ontario as "passengers" on trucks from the United States.

Some introduced species cause little ecological disruption. In fact, introductions can serve useful purposes in some cases. For example, in California some pollution-tolerant species of grasses are used to stabilize slopes denuded of native species which are intolerant of high levels of atmospheric pollution. But generally, most introductions can inflict serious adverse ecological, social and economic impact.

Some impacts are illustrated in the following examples:

...generally, most introductions can inflict serious adverse ecological, social and economic impact.

- Introduced species can have an impact on the genetic integrity of wild life. Wood Buffalo National Park was established to protect the wood bison, a rare subspecies of North American bison. In the 1920s common plains bison were introduced into the Park. Subsequent interbreeding of the two subspecies has jeopardized the existence of genetically pure wood bison in this area.
- Bovine tuberculosis and brucellosis were introduced into Wood Buffalo National Park by infected introduced plains bison. Since then the health of the herd has deteriorated. Despite the enormous ecological, financial (estimates in the tens of millions of dollars) and social costs, an environmental assessment panel recommended, reluctantly, that the most efficient method of managing the situation is to remove all hybrid bison within the Park and replace them with wood bison free of tuberculosis and brucellosis. This is an example of the severe negative effects of an introduction and the absence of readily acceptable remedial actions. No decision has yet been taken to act on the recommendations.

- Introduced species and species which invade Ontario through natural range expansion can have significant impact on wild life habitat. For example, purple loosestrife is changing the ecology of wetlands in southern Ontario by out-competing indigenous plants. To date, no effective control has been found. With global warming, the invasion of other southern and western wild life may have an impact on Ontario's ecosystems as well.

Once an introduced species becomes established, it is very difficult, if not impossible, to eliminate. Moreover, it is impossible to predict how the "new" organism will function. The Working Group believes that the Government of Ontario should give increased attention to the problem of introductions.

Strategy 29: Strictly control introductions into the wild.

Implementation of this Strategy requires improved legislation, clarification of policy, public education, monitoring, and research. There is need for legislation to prohibit the intentional introduction of wild life without careful assessment of the potential consequences of the introduction. The onus for demonstrating that a proposed introduction is acceptable should lie with the proponent. Additional legislation may be required to establish responsibility for measures to deal with escaped animals.

With respect to education and extension programs, it is recommended that government agencies cooperate to ensure that industry (such as plant wholesalers) and homeowners understand the significance of introduced species to the natural environment. Government might develop well-publicized identification keys on species such as purple loosestrife, which might be inadvertently selected for garden patches by unsuspecting gardeners.

The Ministry, in association with other government agencies and academic institutions, should prepare a list of priority species for which research is required, such as addressing the control of purple loosestrife. In addition, the Ministry should initiate a surveillance program, as part of the provincial monitoring program, to detect potentially harmful introduced species.

■ Genetic engineering is a new but rapidly evolving technology which has advanced to the point where it is now possible to alter the genetic constitution of existing life forms and to create "new" ones. The medical, agricultural, and forestry sciences have so far been the primary sponsors of genetic engineering technology, but in the last decade considerable attention also has been given to other applications, such as pollution control and waste management.

There are some aspects of genetic engineering which could have important implications for wild life populations and habitat. For example, the ability to alter viruses and bacteria could have implications for the control of diseases in birds and mammals. The present program to reduce or eliminate rabies in Ontario attempts to immunize foxes by the use of baits containing an oral rabies vaccine. However, the vaccine is not yet as effective in immunizing foxes as desired and is not effective in immunizing skunks, the other major carrier of rabies in Ontario. A new genetically-engineered vaccine is being developed which promises to be more effective in immunizing both foxes and skunks.

In other areas, progress is being made in developing new kinds of stress-resistant and herbicide-tolerant plants. A potential hazard in this kind of work is that modified, domesticated plants may develop the ability to become more invasive.

Improving the nitrogen-fixing bacterium, *Rhizobium*, through engineering, for example, could lead to reduced applications of chemical fertilizers. The use of selected and engineered strains of viruses, bacteria, fungi and yeasts for the control of insects is now an active field of research. Some of these are being used in silvicultural programs and for the control of forest pests. It is anticipated that as their use becomes more widespread there will be a corresponding decline in the use of chemical controls.

Introduction of Genetically-Engineered Organisms

Strategy 30: Strictly control the introduction of genetically-engineered organisms.

Genetic engineering is a new but rapidly evolving technology which has advanced to the point where it is now possible to alter the genetic constitution of existing life forms and to create "new" ones.

Despite the many promising advantages of genetic engineering, there are potential problems and the control of these organisms is a concern to the Working Group. The regulation of genetically-engineered micro-organisms is fraught with difficulties which have been under discussion at the international level for some years. In Canada the regulations authorizing the use of selected and engineered micro-organisms are in an advanced stage of preparation by the federal

government working with the provinces and industry. The Government of Ontario has an Interministerial Committee on Bio-technology with representatives from seven Ministries including the Ministry of Natural Resources. In September, 1989 the Committee issued a green paper setting out the issues for Ontario.

The Working Group supports current initiatives to control the use and distribution of genetically-engineered organisms and urges the Ministry to work with other agencies to ensure that the legislation and regulations are appropriate, and that policies are comprehensive. The Ministry should continue to participate in the Interministerial Committee on Bio-technology, and give special attention to those aspects of the application of biotechnology which may impact wild life and habitat, such as the use of commercially important engineered species which may change the character of future forests.

The Ministry should promote efforts to:

- Implement standards to regulate introductions.
- Develop measures to deal with accidental or intentional, but unwanted, releases into the wild.
- Ensure that the administration of genetically engineered organisms is co-ordinated among the responsible agencies.

WILD LIFE CONFLICTS

■ Conflicts between people and wild life arise when there is a perceived threat posed to a human value by wild life. The concerns centre around personal safety, property damage, and situations where populations appear to be too large. Attempts to resolve conflicts are often controversial. For example, apple growers, whose trees are damaged by browsing white-tailed deer, may urge the reduction

of the local deer population but encounter opposition from neighbours who do not have a similar problem, like to see deer, and are concerned about firearm safety.

In some cases, fears about safety are well-founded, while in others, suspected threats are without foundation. For instance, some species are regarded as undesirable because they can transmit diseases to humans or domestic animals, however, some species may be singled out incorrectly because they are suspected carriers of diseases. For example, in the southeastern United States, white-tailed deer were thought to be carriers of *Leptospirosis*, a disease which causes cows to abort, but an exhaustive scientific study showed that this was not the case.

In other instances, people fear wild life species, such as poisonous snakes, which have the potential to cause them direct physical harm. Unnecessary anxiety may stem from deeply rooted cultural beliefs, as in the case of timber wolves, which have been vilified in many societies for centuries. Sometimes fear results from a lack of knowledge about how to deal with animals such as black bears or invading wasps.

Wild animals are sometimes a threat to safety and property because they are "in the wrong place at the wrong time." Gulls and other birds have caused accidents at airports. In this instance, the problem is aggravated by the planting and maintenance of certain types of vegetation, which provide habitat for the very birds which cause problems. Collisions between white-tailed deer and automobiles in southern Ontario have increased largely because of the parallel increase in the number of deer and the number of vehicles on the highways.

Unnecessary anxiety may stem from deeply rooted cultural beliefs, as in the case of timber wolves, which have been vilified in many societies for centuries.

Farmers may suffer losses through the predation of livestock and crops. Most predation of livestock (such as cattle, sheep, goats, horses, pigs, chickens, rabbits) in southern, southwestern, eastern, and northwestern Ontario is caused by coyotes or dog-coyote hybrids. Except for the Clay Belt region in the northeast, depredation by timber wolves is much less frequent because few wolves occur in agricultural regions. Sporadic instances of predation by black bears have been recorded in eastern and east-central Ontario, and occasionally in the Clay Belt. Destruction of beehives by black bears occurs most frequently in eastern, central and northwestern Ontario where the hives often are located near forested land.

The provincial payment of bounties as a means of predator control was discontinued in the early 1970s. One county continues to pay a bounty on coyotes and

two townships have a fox bounty. Several other counties and townships are attempting to reinstate bounties for some species. Generally, bounties have been shown to be ineffective in reducing losses of stock to predators or in increasing populations of wild prey animals. The Working Group opposes any bounty program and urges the government to ensure that remaining bounty programs are eliminated in the few townships where they continue to be used.

Human / wild life conflict in Ontario is significant and must be managed effectively. (Credit: Ministry of Natural Resources)

Species such as white-tailed deer, black bear, woodchuck, porcupine, raccoon, mice, geese, ducks, blackbirds and other passerines may damage or destroy crops. Hayfields and crops in early stages of development are preferred by white-tailed deer, woodchucks and geese. Maturing grain, fruit, vegetable and corn crops are preferred by porcupines, ducks, blackbirds, robins, starlings and other passerine bird species. In parts of eastern Ontario and the Clay Belt, maturing corn crops often are eaten by black bears. In some instances, deer may cause significant damage to apple trees by browsing and rubbing their antlers on the trees. Herons and kingfishers are frequent predators at fish hatcheries and around fish ponds.

Wild life such as woodpeckers (burrowing into telephone poles), raptors (and other birds nesting on hydro lines) and beavers (obstructing stream flow and causing wash-outs) also cause problems. In addition to the cost of downtime and repair, there may also be implications to safety.

In several protected areas in southern Ontario, including Rondeau and Pinery Provincial Parks, high populations of white-tailed deer have severely damaged their habitat by browsing. Tree species and understorey vegetation have been affected to the point where species composition, distribution and abundance have been changed to such an extent that it threatens the representational quality of Rondeau as a remnant of the Deciduous (Carolinian) Forest. A similar problem is developing in Pinery Provincial Park, where both park vegetation and nearby farm crops are being damaged and destroyed. Conditions are similar in Point Pelee National Park and in the Long Point National Wildlife Area. Most people agree that these problems are real, but there is disagreement about how to solve them.

Sometimes there are problems associated with the protection of habitat for rare, threatened, and endangered species. Many species are adapted to particular successional or other specialized habitats which often require manipulative management to maintain them, whereas the management philosophy of nature reserves is to allow natural processes to proceed. An example is the Karner Blue Butterfly in and around Pinery Provincial Park. This insect depends on a plant associated with open oak woodlands, but the past practice of planting pines and controlling wild fire has resulted in a marked decline of the open character of these plant communities. The response has been to employ controlled burning to simulate the natural ecological regime responsible for maintaining this type of habitat. The situation is further complicated by white-tailed deer which are over-browsing a plant species required by the Karner Blue.

Conflicts with wild life will continue to occur, and the Working Group believes that the Ministry must place more emphasis on measures to deal with wild life conflicts.

Strategy 31: Develop a comprehensive strategy and program to address human-wild life conflicts.

Greater emphasis should be placed on public education and extension programs in dealing with problem wild life. Compensation payments for losses due to predators should be viewed as a final alternative to education and prevention. Tolerance of minor nuisances should be encouraged. Better methods of animal husbandry could minimize predation by wild life, and should be pursued. Building codes could be developed and enforced to reduce problems caused by invasive wild life. Information and training should be provided which will help farmers and livestock producers deal with problems on their own.

Greater emphasis should be placed on public education and extension programs in dealing with problem wild life.

There is need to clarify responsibilities and policies among federal and provincial agencies regarding human-wild life conflicts. This could include issues such as the control of rabies and damage to crops and recreational areas by species such as gulls, geese and white-tailed deer.

Because problems are often local, administrative structures established to address wild life conflict must be flexible and sensitive to local conditions. In urban and semi-rural areas, some municipalities are assuming more responsibility for wild life control and for assisting citizens to deal with wild life problems. The Working Group supports this approach and encourages other municipalities to adopt a similar strategy.

At the present time, farmers are not permitted to kill deer damaging fruit trees or other crops. Although the Working Group prefers non-lethal deterrents (such as fencing), it recognizes that there are cases when fencing is simply not practical or affordable, and therefore recommends that the Ministry licence farmers to kill white-tailed deer that are causing crop damage. This provision would not have a significant impact on the viability of the high deer populations in Ontario, and would only be used when there was evidence of significant damage which could not be addressed through alternative control techniques. It is recommended that the Ministry immediately move to amend the *Game and Fish Act* in this regard.

More research is needed to address conflicts and property damage. It should include recurring problems such as moose frequenting highway edges in search of licks in spring and early summer. In addition, research is needed on the economic and social acceptability of potential solutions to conflicts as well as on non-lethal methods of controlling predators, such as the use of chemosterilants, repellents, aversive agents and perhaps even the use of light and sound.

Domestic and Feral Animals

■ During the workshops, some participants were concerned about the impact of domestic and feral animals on wild life. There are two major aspects to this concern: first, direct harassment, killing, and competition, and second, genetic dilution of wild animal populations.

While domestic and feral cats kill small mammals and birds, the extent and frequency of their predation are unknown and have not been studied in Ontario. Studies elsewhere indicate that predation in urban areas can be significant. It is reasonable to assume that impacts are probably greatest in southcentral Ontario where the density of pets is highest. It is also reasonable to assume that impacts are increasing, along with the general increase in human population. It appears that the number of stray cats in many rural areas is increasing.

The extent and frequency of harassment of wild life by domestic and feral dogs is also poorly understood because it has not been studied in Ontario. The most apparent problem is the harassment of white-tailed deer by dogs, particularly during late winter when snow conditions often restrict deer movement. The incidence of this type of harassment is highest in southcentral and eastern Ontario.

While a concerted effort has never been made to address predation by cats, legislative measures have been devel-

oped to address problems caused by dogs. In both urban and rural areas, all dogs must be licensed; but this regulation is not always followed. Further, conservation officers and the police have the authority to shoot dogs caught running deer. Farmers also have the authority to kill wild canids, dogs and feral dogs, to protect livestock.

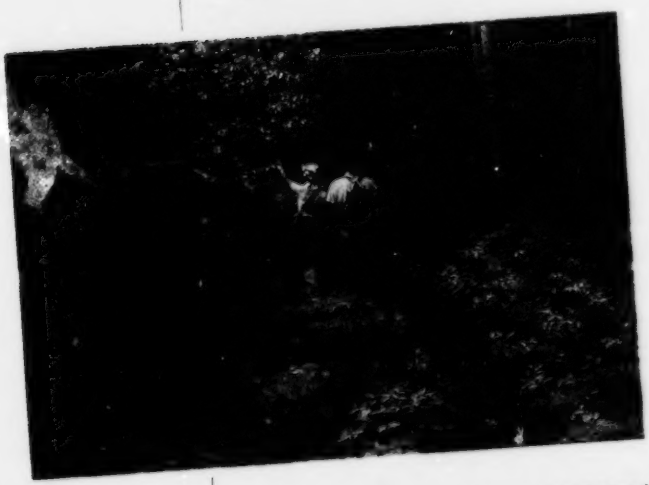
Domestic pets can sometimes interbreed with wild life species thereby diluting wild genetic stock. The main genetic change in a wild canid species is expressed in coy-dogs, a result of the hybridization of coyotes and dogs. Shortly after the invasion of coyotes into southern Ontario in 1919, hybrid dog/coyote, "coy-dogs" began to appear. "Difficult-to-identify" canids became more common as the spread of coyotes continued. Coy-dogs are now most common in southwestern, southcentral and eastern Ontario where contact between domestic and/or feral dogs is highest. The percentage of coy-dogs in the wild canid population is unknown but may be as high as 25 per cent in some areas. Coy-dogs are often larger and less wary of people than coyotes and thus, potentially, are more dangerous predators of domestic livestock.

Effective education programs should be developed to promote responsible pet ownership, including measures to encourage more widespread neutering and spaying to reduce numbers of unwanted pets. Municipalities should be encouraged to employ municipal by-laws to control free-ranging feral cats and dogs.

Although limited captive breeding experiments with coyotes, dogs and their offspring have been conducted in Ontario, few ecological studies of canid hybrids have been completed. Research should be undertaken to assess the impact of domestic and feral cats and dogs on wild life and to understand the ecology and behaviour of coy-dogs.

DISTURBANCE FROM RECREATIONAL ACTIVITIES

■ Recreation activities which affect wild life in Ontario include, but are not limited to: hiking, canoeing, picnicking, snow-mobiling, motor boating, swimming and rock climbing. Although little information is available on the overall collective impacts of these activities on wild life, we know that they occur, and may have some impact.



With continued participation in outdoor recreational activities and access to remote areas, the impacts of such activities may collectively contribute to the loss of wild life and habitat. (Credit: Ministry of Natural Resources)

For example, wake from a motorboat can destroy loon nests located at the water's edge. Colonial nesting, beach nesting, and rock nesting birds can be disturbed during critical nesting periods by hikers and rock climbers. Hikers can unknowingly trample rare, threatened, and endangered plants. All terrain vehicles (ATVs), in addition to damaging habitat, can also disturb wild life during critical periods.

With the increasing interest in outdoor activities and increasing ability to reach remote areas, the impacts of such activities may collectively contribute to loss of wild life and habitat.

Strategy 32: Control disturbance from recreational activities on wild life.

Much of the damage resulting from these activities is unintentional and occurs out of ignorance. It is important, therefore, that reliable knowledge about the impacts of recreation on wild life is integrated into education and extension programs. The Ministry should develop an inventory and monitoring program to assess the magnitude of impacts resulting from such disturbance.

Use of Wild Life

Values and Wild Life

Respect for nature requires that we accept responsibility as its stewards – it means that we are responsible for the way we treat all aspects of nature ranging from large ecosystems, to populations and lastly to individual animals. Such caring and respect can be achieved only if the values which form the foundation of our society, and the goals and objectives to which we aspire, are appropriate.

What values do we want? Are we presently employing the correct ones, and with the appropriate priority and emphasis?

Values are generally derived from three sources. The first type of values are derived from our cultures, the learned likes and dislikes that are peculiar to societies and religions. These are important values because culture, among other things, provides a foundation for intellectual and attitudinal development. Therefore a prerequisite for the integration of wild life values into Ontarian society involves the inclusion of such values in all of the Province's cultures. The second type of values are the unique, inherited values from which emerge instinctive dislikes and likes; they are the personal preference values.

The third type of values are the intrinsic values of objects. Participants in the Ministry's and the Working Group's workshops regularly spoke of the intrinsic value of wild life. It is a value which exceeds the utilitarian values normally associated with monetary measures. It is the value that nature projects in its beauty and in its life support role as the living ecosphere. It is a difficult type of value to measure. But we should recall John Livingston's thoughts on this subject when he wrote:

"The values attached to wildlife by me or by anybody else have no existence outside our own minds, so we must admit that wildlife, like any other value, has no intrinsic worth. It has only the worth that you or I choose to give it."

It is in this context, "...the worth that you or I choose to give it", that the potential for conflict between individuals and different wild life user groups arise, as each believes their respective value system best serves the interests of wild life. In the confrontational dialogues between those holding differing values, there is sometimes a tendency to ascribe "rights" to wild life. Again Livingston comments:

"The notion of right is untenable outside human society. One simple example will do. Leopard eats gazelle eats grass eats soil nutrients. If the gazelle had rights with respect to the leopard, the leopard would starve."

Despite Livingston's rationale, it is because each of us, in our appreciation of wild life applies our own set of values

toward wild life, and in keeping with those values, we endow it with commensurate "rights" and intrinsic value. As a result, our differing sense of rights and values conflict.

On what basis can a modern, multi-racial and multi-cultural society reconcile the differing views, needs and uses which it currently ascribes to wild life? The process of preparing a provincial wild life strategy begins not only with the recognition that humankind is an integral part of nature, but with the recognition that we have the technological skills to determine, to a large extent, the nature of the environment in which we live. In acknowledging this power, and our stewardship responsibilities, we must provide for the welfare of Ontario's ecosystems and their wild life resources, for which we are responsible.

All of us, in our appreciation of wild life, apply our own set of values.
(Credit: Paul Gray)

PEOPLE AND WILD LIFE

Everything we do has some impact on the ecosystem in which we live.

■ Everything we do has some impact on the ecosystem in which we live. Our influence may be pervasive, as in the case of acid precipitation, or localized, as in the clearing of a woodlot. Even a walk in the forest or along a river bank leaves its imprint. In earlier sections we addressed some of the indirect impacts of human activities, mainly through habitat modification. However, there are many other types of interactions with wild life which are deliberate, including: angling, hunting, trapping, viewing, collecting, taking wild life into captivity and harvesting wild plants and their fruits.

Most of the deliberate contacts with wild life have grown out of long-standing traditions.

These interactions are so diverse that it is difficult to include them in a single word. "Use" may be inadequate because for some people it implies "consumption", such as harvesting trees, moose, beaver and fish, whereas millions of Ontarians derive many benefits from contacts with nature but consume or disturb ecosystems and populations very little. This is not to say that there is no impact but that what there is, is generally less than that of other "consumptive" actions.

Most of the deliberate contacts with wild life have grown out of long-standing traditions. For instance, the importance of wild life to aboriginal peoples derives from their ancient traditions. The attitudes towards wild life of many other citizens of Ontario, have their origins in practices and attitudes long established in Britain and the European countries. These include the taking of a variety of birds and mammals and some plants for food and sport, and the operation of zoos, animal shows, botanical gardens and museums stocked with thousands of specimens of native and non-native species. Hunting methods have included the use of pack hounds and coursing dogs, birds of prey, firearms of many kinds, bows, and an array of traps and nets. There is also a long tradition of personal enjoyment in the study of natural history and the accumulation of private collections of natural history objects, including bird's eggs and nests, butterflies and rare plants. All these activities have been accepted and, indeed, approved.

The early settlers brought these traditions to North America and adapted them to their new circumstances. At first, the taking of wild animals and plants for food was necessary for survival, and the fur trade became one of the first international industries in this country. Later, however, "game" species, which previously had provided food and other useful articles,

took on a sporting or recreational significance in the European tradition and trapping became a North American tradition. With increasing urbanization and prosperity, museums and scientific institutions were established and began to compile reference collections of flora and fauna. Zoos holding native and non-native animals imitated the traditions of the Old World by providing opportunities for citizens to learn about animals they would not otherwise be able to see. Some American circuses were, and are, famous for their animal displays and performers. That these traditions are still valued social institutions is clearly evident today.

But, as we have discussed elsewhere in this Strategy, we live in a time of changing values toward the natural world. Television now brings into our homes images of wild life from around the world which can scarcely be matched by zoos, animals shows, displays or museums. Although some television programs may convey a distorted view of the reality of nature, especially when it comes to abundance and extent of remaining habitats, they remain a major source of information for many people. Museums and plant and animal collections continue to serve an important role, but the scientific collecting necessary to establish a foundation of knowledge of the flora and fauna of this country, although far from complete, is now extensive enough that the taking of at least some plants and animals can cease or be reduced to a minimum.

Another driving force behind changing values is recognition that habitats and populations around the world are diminishing and that extinctions are increasing at an alarming rate. This has sparked numerous international efforts, such as the banning of trade in elephant ivory, and establishment of the Convention for the International Trade in Endangered Species (CITES).

Concern for wild life is also evident at the local level. It is ironic, and perhaps significant, that much of the concern for the welfare of wild life is expressed by people living in urban environments where most people now live. In this setting, contacts with wild animals and plants are limited to a few species and isolated natural habitats. Encountering animals killed or injured by vehicles or other human hazards are often the main contact with wild life. In addition, many urban people experience wild life through conflict with, for example, raccoons, pigeons and Canada geese. Humane societies are frequently overwhelmed with young, apparently orphaned, mammals and birds brought in by distressed citizens.

These examples serve to remind us that our values respecting the "use" of wild life are changing rapidly. Beyond the concern for the survival of many wild life species, and the welfare of individuals, there is some support for a re-evalua-

tion of the traditional "consumptive" uses, such as hunting, trapping, collecting and the taking of wild life into captivity.

In North America, government agencies responsible for the stewardship of wild life are hurrying to catch up with changing attitudes. Gone are the days when the principle "users" of the wild life resource and critics of the agencies responsible for its management were hunters, anglers and trappers. Now managers must attend to a greater range of issues and the conflicting demands of many more "users".

The collecting and study of common plants and animals by children are examples of the types of educational activities the Working Group would like to see encouraged.
(Credit: Ministry of Natural Resources)

In North America, government agencies responsible for the stewardship of wild life are hurrying to catch up with changing attitudes.

In striving to understand and evaluate the various value systems and viewpoints represented by the people we met, the Working Group gained some insight into the difficulties of meeting the expectations of all who wish to "use" wild life in one way or another. It will take time and concerted effort to reconcile the various conflicting positions in a completely logical way.

In arriving at the strategies in the following pages we considered many ideas including:

- Our primary goal is to sustain populations and habitats.
- Humans are an integral part of ecosystems and depend on them for resources.
- Interactions with wild life should take place in the wild.
- Ideally, interactions should involve a one-to-one relationship in which the person involved assumes full responsibility for the outcome of the contact.
- In cases where animals are removed from the wild, it is to be done in a humane and responsible manner.

- In regulating human/wild life interactions, the following factors must be considered:
  - Adequacy of knowledge to allow the activity without unacceptable consequences.
  - Compliance with regulations is assured.
  - The ecological, social, cultural and economic factors.

The Working Group has not succeeded in creating an entirely consistent framework for the regulation of the use of wild life. We do, however, provide some guidance for continued dialogue and debate among the various interest groups and government agencies. We conclude that current trends in attitudes toward the use of wild nature requires that we consider stopping some traditional activities and modifying others. There is need for clearer declarations by the Government in legislation and policy to identify and set limits on acceptable uses.

We make some recommendations for change and propose mechanisms for the resolution of some outstanding issues. We realize that some of our recommendations will inconvenience some users and affect the livelihood of others. These are aspects which must be considered in deciding to accept or reject the recommended strategies.

PAYING FOR WILD LIFE

■ In one way or another, we pay for the natural resources we use. A society which places high priority on industrial output may pay for that output in reduced environmental quality. At the other extreme, a society which completely rejects industrialization, pays for it through a re-

Ontarian's want jobs, a high standard of living, strong social and cultural programs, all within a clean, healthy environment.

Historically, market prices have not reflected the true value of our natural resources, principally because they failed to account for ecological and social costs, or for prevention, clean-up, and rehabilitation of degraded ecosystems. In many instances, use of natural resources is designed to maximize individual, short-term income at the expense of the natural "capital" resource base.

duced standard of living. Ideally we seek a future which lies between these extremes – Ontarians want jobs, a high standard of living, strong social and cultural programs, all within a clean, healthy environment.

Historically, market prices have not reflected the true value of our natural resources, principally because they failed to account for all production costs, ecological and social costs, or for protection, clean-up, and rehabilitation of degraded ecosystems. In many instances, use of natural resources maximizes short-term income at the expense of the natural "capital" resource base. The economic performance of various land uses are generally over-estimated because the loss or deterioration of natural "capital" and damage to the environment have not been factored into the equation.

The Working Group believes that resource pricing must include ecological, social, cultural and economic values. Such cost accounting will contribute to the prevention of over-use and waste – it will provide an incentive for sustainable use, for "wise use". Some mechanism to require beneficiaries to pay for this use of the resource is necessary.

The "beneficiary pay" concept is simple – direct and indirect users of the resource pay for the privilege of using it. But to implement this concept we must assign value to our resources within a comprehensive valuation framework, and given the diverse array of social, economic, cultural, and environmental values, the task is daunting, to say the least.

Finding a Method

■ In search of a suitable "beneficiary pay" process and formula, the Government of Ontario must define and determine the "full value" of the province's resources, and it must co-ordinate development of practical techniques which can be used to complete this task. For example, there are primary or direct users such as hunters and bird watchers, who derive direct benefit from wild life while others are indirect or secondary beneficiaries, in that while they do not hunt or watch birds, they take some satisfaction in knowing that such an option is available, or that they derive a healthy existence from a healthy ecosystem to which wild life contribute.

Many participants at the Working Group and the Ministry workshops supported "beneficiary pay" in principle, but only if the process is fair and equitable. For example, some were adamant that land and water are significantly undervalued and that industry and consumers must start paying a fair price for them; if users destroy or degrade them, they should pay for that as well – the "polluter pay" concept. The Working Group agrees, but unfortunately, it did not identify a specific process or formula which it could recommend to the Government of Ontario.

Many participants at the Working Group and the Ministry workshops supported "beneficiary pay" in principle, but only if the process is fair and equitable.

Strategy 33: Develop a "beneficiary pay" policy.

The Working Group acknowledges that the problems surrounding development and implementation of a "beneficiary pay" program are immense, but it also believes that such a program is crucial to ultimate attainment of the goal of healthy ecosystems. Because "beneficiary pay" requires that we fully value, or fully account for, our natural resource assets, the Working Group recommends that the Ministry establish a Task Force comprised of representatives from government, industry, non-government organizations, and academic institutions to address this issue. The Task Force should undertake to provide an important foundation for a tenable ecosystem approach through the creation of a realistic "beneficiary pay" program.

There are a number of tools with which government can implement a "beneficiary pay" program. These should be evaluated within the context of the foregoing concerns. They include, but are certainly not limited to:

- The existing taxation and revenue generating mechanisms currently employed by the province.
- Direct user fees.
- Regulatory charges.
- Royalties, penalties, and the sale of forfeited goods.
- Stamp and print programs.
- Volunteer work.

In addition, the Working Group suggests that the Government of Ontario sponsor the creation of a **Natural Resources Card**. Such a card could provide a number of benefits, including an efficient method of payment for resource use, distributing education and extension materials, and providing user updates. From a different perspective, the Task Force should be asked to identify and review subsidies and incentives which encourage non-sustainable forms of economic activity, with the goal of eliminating them.

Funding

■ The inadequate funding of wild life programs was constantly raised as an issue by people in the Ministry and at the Working Group workshops. The results from the 1987 survey on "The Importance of Wildlife To Canadians" indicate that, in Ontario, activities related to birds, mammals, and other wild life generate more than 62,000 jobs, and that the contribution of wild life expenditures by residents alone to the gross domestic product of the province is more than 2.2 billion dollars annually. Furthermore, tax revenue related to wild life is more than 360 million dollars. It is important to note that these estimates come from a resident database only, and in response to a somewhat restricted definition of wild life. If non-resident expenditures were added, and the expanded definition of wild life recommended in this Strategy applied, the economic value would increase substantially.

The results from the 1987 survey on "The Importance of Wildlife To Canadians" indicate that, in Ontario, activities related to birds, mammals, and other wild life generate more than 62,000 jobs and that the contribution of wild life expenditures by residents to the gross domestic product of the province is more than 2.2 billion dollars annually.

Yet, despite this impressive value, the annual budget of the traditional "Wildlife Program" is only 25 million dollars.

Strategy 34: Increase funding for wild life protection and management programs.

The Working Group believes the Government must provide more funding for wild life programs. Workshop participants consistently cited the "special funds" concept as a tool which can be used to assist wild life programs, but many were disappointed with the Government's failure to carry through with its commitment to devote new fishing licence money to fishery programs.

The Working Group supports the "special funds" concept and recommends that it be carefully considered. It recommends consideration of "special program funding" provided through a foundation to be operated at arms-length from government. Contributions could be made from many sources, including: on a matching basis by government, revenue from the "natural resources card", private and corporate donations, portions of licence fees, benefactions from wills and stamp and print programs. Government agencies and any qualified private or corporate body could apply for funding to finance approved wild life projects.

ALLOCATION OF WILD LIFE

Allocation is the process by which society assigns use of a resource. This process is at the root of many resource use issues.

■ Allocation is the process by which society assigns use of a resource. This process is at the root of many resource use issues. Decisions about allocation are based on the values of, and the associated priorities which society places on, a natural resource. Allocation reflects our valuation of a resource, the size and location of the resource, and how best to use it.

Traditionally, wild life allocation issues have focused on allocation to hunters and trappers. The Ministry has worked to allocate these resources according to biologically sound principles based on estimates of population size, recruitment into the population, and mortality.

Strategy 35: Establish an allocation process within an ecosystem approach to the protection and management of Ontario's wild life.

An allocation process must be necessarily broad and comprehensive – and it must consider all values, from the beginning to the end of the process. For example, hunters compete with each other (residents, non-residents, aboriginal peoples, and trappers) for a portion of the hunted resource while simultaneously competing with non-consumptive users and other consumptive users such as land developers. They also compete with other ecosystem components, such as wolves, for use of the resource. Allocation issues must be resolved if an ecosystem approach is to be successful and our natural resources managed on a sustained basis.

The priority allocation must be to sustain the resource. This will require that the data and information about the resource be reliable, adequate and current. An allocation process must be supported by a comprehensive inventory and monitoring program, and it must be coupled with the value systems.

An allocation process must be necessarily broad and comprehensive – and it must consider all values from the beginning to the end of the process.

The Working Group recognizes that this is not an easy task. Not only are there problems associated with making decisions about values, but our knowledge of the resource, at least from an ecosystem perspective, is limited and requires considerable enhancement. In spite of these problems, the Working Group recommends that the Government of Ontario

The priority allocation must be to sustain the resource.

begin work on allocation as soon as possible. In addition, the Working Group recommends that, as part of this process, the Government develop and employ conflict resolution techniques.

Providing Access to Wild Life

■ Adequate access to wild life is important to Ontarians – it is an allocation issue. Without access, people cannot hunt, trap, collect, study, or view wild life. For tour operators or outfitters, access is a commercial issue, for many hunters and viewers it is a social issue, while for all Ontarians it is an ecological issue. While nearly all agree that there should be access to wild life, there is disagreement about the location of access and the extent to which it should be permitted.

The Working Group heard several examples of access-related issues, including: location and restriction of Crown land road access, human disturbance of wild life, reduced access to wild life on private lands, access to special areas such as provincial park reserves and crown game preserves, and access to wild life by the physically handicapped.

Issues related to Crown land access include the location and permitted uses of forest roads. Some people, such as tourist business operators, do not want access roads near their remote locations because they feel that these roads detract from the quality of the wilderness experience they offer their customers, and that they negatively impact upon their business. On the other hand, users such as loggers, miners, hunters, trappers, and some viewers, want increased access to these remote areas.

Once roads are constructed on Crown land, many people argue that they have the right, as taxpayers, to use them. The experience of Ministry staff is that once a forest road has been constructed on Crown land, it is very difficult to con-

Once roads are constructed on Crown land, many people argue that they have the right, as taxpayers, to use them. (Credit: Paul Gray)

trol access. This point is especially true with the large increase in the number and use of all terrain vehicles (ATVs) and snowmobiles in recent years.

Some groups are concerned that ready access will result in the harassment of wild life (such as viewing and photographing wild life) during critical breeding periods – they maintain that access should be controlled. For example, disturbing great blue heron colonies can lead to increased mortality of young birds.

Reduced access to hunters, naturalists, and other enthusiasts to wild life on private land is largely a southern Ontario issue, although in recent years, it has also surfaced in central and parts of northern Ontario. In southern Ontario, the problem is exacerbated by increasing urbanization and associated loss of habitat. There has been a corresponding erosion in the number and diversity of areas available to wild life recreationalists. On the other hand, private landowners are concerned about safety, liability, and property damage.

The issue of access and permitted uses in protected areas is complex. Currently the *Game and Fish Act* prohibits hunting and trapping in all provincial parks except as provided in the regulations. The 1978 Parks Policy was updated in 1988, and states that hunting by non-aboriginal people is not an acceptable use in all wilderness class parks and provincial nature reserves. These policies also direct the Ministry to eliminate all trapping within provincial parks by the year 2010.

Some groups are concerned that ready access will result in the harassment of wild life (such as viewing and photographing wild life) during critical breeding periods – they maintain that access should be controlled.

In the remaining classes of parks, the *Provincial Parks Act* permits hunting in some if prescribed in an approved management plan. The issue surfaced in 1988 when the Ontario Cabinet stated that hunting and trapping in most provincial parks established since 1983 would not be permitted, unless confirmed as an acceptable use in an approved park management plan. This decision generated considerable debate because many people in northern Ontario accepted the increase in the number of parks in 1983 on condition that hunting and trapping would be permitted as acceptable uses. To address concerns of this kind, as well as others relating to access to wild life in protected areas, the Working Group recommends that a comprehensive review be completed.

Strategy 36: Establish a Task Force to review the use of wild life in protected areas.

It is recommended that the Task Force be comprised of representatives

from government, non-government organizations, industry, and the public. The work of this Task Force should be linked to the examination of a system of protected areas recommended in Strategy 12.

From an ecological perspective, there are several well documented cases where prohibition of hunting has had negative effects on a species and its habitat. White-tailed deer have seriously reduced the variety and abundance of several plant species at Rondeau and Long Point Provincial Parks. Woodland caribou in Slate Islands Provincial Park reached excessively high densities before the winter of 1989-90 and subsequently suffered a heavy die-off. Extremely heavy browsing by woodland caribou over the years, compounded by a lack of predators and hunting, resulted in the death of 500-600 animals due to starvation in the winter of 1989-90 and a serious deterioration in the carrying capacity of the habitat.

The recreational harvest of wild life in these areas has generally been very difficult because of public opposition. A recent harvest of several hundred deer on federal lands at Long Point in Lake Erie has alleviated the damage to vegetation there, but the problem persists in Rondeau Provincial Park.

The Working Group also noted concern about access to wild life by senior citizens and handicapped people. Given that our society is growing older, the problem merits attention. In Ontario, some efforts have already been made to increase access for disabled people, such as permitting disabled hunters to hunt from stationary vehicles in areas where roadway restrictions do not exist, and constructing viewing towers and boardwalks. The Working Group supports such initiatives and encourages the Government to provide access where it is ecologically sound and does not jeopardize public safety.

Strategy 37: Manage access.

Equal right of access cannot be given or applied broadly or consistently across the Province. For example, some sensitive habitats require protection from trampling by photographers or protection during critical breeding periods. In other cases, protection of geographically isolated animal populations requires restrictions on hunting and trapping. Therefore, there is need for geographically sensitive policies respecting access to private and public lands. A provincial policy is needed. In creating it, the Ministry, should consult widely.

Access to wild life must be addressed within an ecosystem context, where priorities are established to protect rare or endangered species, and habitats. Such a program will require a sound database, education and extension programs, and effective communication programs. In addition, there are a number of socio-

economic aspects of the access issue which must be addressed in order to minimize or eliminate conflict between different user groups, including hunters, people seeking a wilderness experience, senior citizens, and the disabled.

In support of such a program, the Working Group recommends that the Ministry complete a study to clarify the extent of access problems on a regional and local basis, and establish a process to evaluate and mitigate impacts on wild life and wild life habitat across the Province. This study should be done jointly with non-government organizations and other agencies who are responsible for land and water management in Ontario.

Equal right of access can not be given or applied broadly or consistently across the province.

CULTURAL ASPECTS OF WILD LIFE USE

Aboriginal Peoples

■ Land and wild life play a central role in traditional aboriginal cultural, economic and spiritual systems, institutions, and practices. Wild life continues to provide food and raw materials for some aboriginal peoples, who are affected by, and concerned with, wild life protection and management programs administered by the Government of Ontario.

Currently, many people are confused and misinformed about the taking of fish and game by aboriginal peoples, particularly during times of the year when it is illegal for others to harvest fish and game. The *Constitution Act* of 1982 affirms and

Land and wild life play a central role in traditional aboriginal cultural, economic, and spiritual systems, institutions, and practices.

Wild life plays a central role in many aspects of aboriginal culture. (Credit: Ministry of Natural Resources)

recognizes existing treaty and aboriginal rights, including the right to hunt; however, they have not been clearly defined. The 1701 Treaty signed by the British Crown, in conjunction with the *Indian Act* and the 1982 *Constitution Act*, has been affirmed by an Ontario court as protecting the right of aboriginal peoples to hunt. There have been similar decisions in other parts of Canada. Since treaty and aboriginal rights are constitutional rights, they override provincial legislation. Therefore some portions of the *Game and Fish Act* of Ontario appear to be irrelevant to aboriginal peoples.

The Working Group believes that aboriginal peoples must have an opportunity to assume a formal role in managing and protecting Ontario's wild life. The Government of Ontario should encourage such participation.

Strategy 38: Encourage aboriginal peoples to participate in wild life protection and management programs.

The Government of Ontario should press for clarification of the legal rights of treaty and aboriginal peoples respecting wild life in Ontario.

Within an ecosystem context, there is need to manage all land wisely. In many cases, land use activities which occur outside reserves affect the land, water, air, and wild life. Conversely, land use activities conducted on reserves can affect the resources on surrounding lands. Therefore the Working Group recommends that government and aboriginal peoples join in an effort to protect and manage natural resources in and around reserve lands. The Government should ensure that aboriginal peoples are involved, along with other members of the public, in the planning and implementation of co-ordinated wild life research, management, and enforcement programs.

Involvement of aboriginal peoples in planning, research, and management programs will provide them an opportunity to ensure that their interests are reflected in provincial programs. The Government and aboriginal peoples should work cooperatively to ensure that their knowledge and understanding of wild life is reflected in education and extension programs. The employment of aboriginal peoples as wild life professionals in government and in academic institutions would enhance the evolution of wild life programs in Ontario. The Provincial and Federal governments should work together to encourage aboriginal peoples to enter these professional fields by reviewing opportunities for on-the-job training and for college and university placement.

Other Cultures

■ Ontario is a cultural melting pot; it is comprised of people representing at least 35 European cultures, 25 Asian and African cultures, 10 South American cultures, Americans and a number of people of multiple origin. Although Ontarians belong to many cultural groups, all with differing values and perceptions about wild life, they are all subject to the same federal, provincial, and municipal legislation.

Although we know little about the values, perceptions and knowledge of wild life held by the numerous cultural groups in Ontario, a study of leisure behaviour and recreation needs of Ontario's cultural populations, published by the Ministry of Tourism and Recreation, suggests that leisure behaviour and attitudes vary significantly according to cultural background. In this study, 17 cultural groups were analyzed, and differences were found in leisure participation patterns, the social context of participation, leisure values, and motivations.

Strategy 39: Encourage Ontarians of all cultures to participate in wild life protection and management programs.

Education and extension programs should be sensitive to the cultural groups in the Province. There is considerable opportunity for the Government to work

Wild life resources are important to Ontarians. The results of the survey on "The Importance of Wildlife to Canadians" indicate that 93 per cent of the province's residents (more than 6.8 million) participate in one or more activities related to wild life; 85 per cent of the respondents stated that it is important to maintain abundant wild life, while 87 per cent indicated that it is important to preserve endangered or declining wild life (Filion et al. 1989).

co-operatively, and in partnership, with various wild life oriented non-government organizations and with culturally focused non-government organizations to develop and disseminate wild life extension and education material. The Working Group recommends that the Government commission a study to examine and articulate the perceptions about, and the uses of, wild life in Ontario, and on the basis of the results of this study, design extension and education programs.

Monitoring Socio-Economic Trends

■ Historically, the Ministry has sponsored the collection of selected types of socio-economic data. It has collected statistics on hunters and trappers through mailed surveys, check stations, and fur returns. In addition, the Ministry is an active sponsor of the survey on "The Importance of Wildlife to Canadians". Both types of survey provide valuable data and information. But the Working Group is concerned that declining budgets have caused an erosion of the hunter survey data. For example, statistics on small game hunters have not been collected since 1980.

Strategy 40: Monitor socio-economic trends.

In order to develop and improve education and extension programs, and to enhance research, management, and policy development, socio-economic data and information about wild life must be current and relevant to Ontario. The Working Group recommends that Ontario continue to support and participate in the "Importance of Wildlife to Canadians" survey, and where possible, provide detailed analysis of the Ontario portion of the study. Historically, the Ministry has not used this rich source of data in the monitoring of social attitudes and in the development of programs. Although it is only one source, it is an important one, and should be used accordingly. In addition, the Working Group recommends that the Ministry strengthen its annual mailed survey of hunters.

COMMERCIAL USE AND SALE OF WILD LIFE

■ Within the limitations of the ideas outlined on pages 108 and 109, the Working Group is not opposed to commercial use of wild life. Nature tours, hunting and fishing lodges, and trapping are, in the opinion of the Working Group, examples of acceptable activities. Nor does the Working Group object to the sale of wild life parts from legally harvested animals and plants. Such use reduces waste. Animal parts are used in support of legitimate arts and crafts industries, which are particularly important to aboriginal peoples.

However, direct exploitation, such as commercial hunting for meat and animal parts, the sale, trade, or barter of raptors for commercial gain, and unregulated exploitation such as excessive killing and collecting of wild life for the biological supply industry, are unacceptable.

POACHING

■ Poaching can have significant negative impact on wild life populations. There are four "types" of poachers in Ontario. The "unintentional poacher" commits a violation in ignorance of the law or through mis-identification of wild life. These people are not normally repeat offenders, and efforts to minimize unintentional poaching can best be handled through education and extension programs.

The "opportunistic poacher" sets out with the intention of hunting legally, but when opportunity arises, kills an animal for which he or she is not licensed. "Opportunistic poachers" often take non-game species such as hawks, owls, herons, furbearers and other animals. For example, in 1986 two nesting bald eagles on Manitoulin Island disappeared and were believed shot, and in 1985 a female peregrine falcon was shot near Arnprior; the fate of her two offspring was never determined. A few hunters take an animal illegally and look for a person with a validation tag willing to share the animal.

The third type of poacher is the "deliberate poacher"; a person who purposefully poaches. Although profit is not the primary motive, this type of poacher usually steals enough for family use or for sharing with friends and neighbours.

The most serious poacher is the "commercial poacher". This type of poacher is motivated by profit. White-tailed deer and moose are the most sought after species, but poaching of birds of prey for feathers, deer for antlers and velvet, and reptiles and amphibians for sale as pets, for example, also occurs. The "commercial poacher" can be a serious threat to wild life populations.

Several undercover investigations in the past few years have exposed illegal commercial deer poaching operations. In the fall of 1986, for example, a Ministry undercover operative purchased 16 deer on three occasions during a three-month period. The investigation revealed that the poachers harvested and sold more than 60 deer (and wounded many more) in a single fall season.

Although few statistics are available, poaching is thought to be a significant problem throughout Ontario. For example, it is estimated that poaching of moose substantially reduces hunting and viewing opportunities.

The sale of wild life parts for use in Oriental pharmacology is an extremely lucrative business, and has added an entirely new dimension to poaching. In June 1985 an Air India Boeing 747 bound for new Delhi from Toronto exploded and crashed into the Irish Sea. Its cargo included 32 kilograms of dried gall bladders taken from approximately 1,000 black bears and valued at about one million dollars. It is not known if these galls were taken from black bears legally harvested Ontario.

The United States is the largest consumer of wild life in the world, importing and exporting more than one billion dollars in live wild life and wild life products annually. Estimates of the illegal trade in wild life parts range from one quarter to one third of the total. The extent to which Ontario's wild life contributes to illegal activities in the United States is unknown, but it is thought to be significant, particularly in view of current import/export legislation. In addition, there is a market for Ontario's wild life in other parts of the world. Several special investigations have uncovered these illegal commercial operators who operate in both Ontario and the United States.

In 1984, an international investigation completed by the Ministry and many other enforcement agencies exposed extensive trade and sale of endangered species such as eagles and falcons. Investigations suggested that the nests of peregrine falcons, gyrfalcons and other birds of prey, throughout Canada, were regularly robbed of eggs and chicks. Information from sources developed during the course of this investigation indicated that the poachers knew the location of many

raptor nest sites in southern Ontario and that the nests of the northern goshawk, merlin, and red-shouldered hawk were robbed regularly.

Strategy 41: Strengthen the ability of the Ministry of Natural Resources to combat poaching, with particular emphasis on commercial operations.

Poaching undermines efforts to monitor and manage wild life populations. In some cases illegal activities may destroy or prevent the recovery of isolated or depressed populations. The Working Group believes that poaching may be a serious issue and it is concerned that so little information about it is available.

The Working Group recommends the appointment of a Task Force to study the extent of poaching and ways of enhancing the ability to combat it (such as, adequacy of the staff complement, use of forensic techniques like DNA technology, enhancement of measurement of enforcement effectiveness, improved intelligence gathering and the promotion of public assistance through "community watch" and "Report-A-Poacher" programs). The Task Force should also review the adequacy of current legislation and the need for new legislation, including the possibility of establishing a two-year statue of limitations (currently six months), and consider increased penalties for commercial poaching, such as, jail terms and/or automatic loss of hunting privileges, at the discretion of the court. There is also a need to ensure that enforcement staff can co-operate more fully with American and other Canadian jurisdictions in international and interprovincial enforcement activities.

Poaching undermines efforts to monitor and manage wild life populations.

Education and extension programs are important tools which can be used to improve public awareness of poaching. The Ministry should describe the potential impacts of poaching on Ontario's wild life in these programs. They can contribute to a new understanding of wild life, and to the entrenchment of stronger moral and ethical values.

WILD LIFE IN CAPTIVITY

Native wild life: include plant and animal species (including the progeny of such plants and animals) that are indigenous to Ontario, have been imported, or have entered the province by any other means, and survive as self-sustaining populations.

■ There are many situations where native wild life are kept in captivity, including: zoos, biological supply operations, pet stores, baitfish operations, gardens and green houses, game farms and game ranches, fur farms, recreational use of falcons, government and academic research and monitoring facilities, temporary holding facilities prior to release back into the wild, and rehabilitation facilities.

The Working Group deplores the capture and confinement of wild animals throughout the world when this capture is not clearly demonstrated to be for the benefit or survival of the species.

The Working Group deplores the capture and confinement of wild animals throughout the world when it is not clearly demonstrated to be for the benefit or survival of the species. It does not support the collection and confinement of wild animals for displays, exhibits, shows, for trade and sale, or for recreation. Such activities are often inhumane. Nor does the Working Group support the collection of certain species of wild plants. At the same time, the Group recognizes that some facilities such as accredited zoos and rehabilitation facilities have a useful role to play.

In addition, it recognizes that some common plant populations can withstand the loss of a few individuals, and does not want to recommend that the public be denied access to them. But the indiscriminate removal of plants, particularly rare, threatened and endangered species for commercial or private propagation should be discouraged.

The Working Group believes that considerable educational value is derived through private collections of common plants and animals. The collection of common plants and insects by children for education programs, are examples of the types of activities the Working Group would like to see encouraged by government, academic institutions, and non-government organizations. People who collect rare, threatened and endangered species, or animals which require special, often sophisticated, care for their personal use exemplify collecting practices which must be discouraged.

A zoo: is a permanent, geographically fixed private or public collection of live non-native and/or native wild life.

Animal shows: are mobile collections of live animals put on display and, in some instances, made to "perform". These shows are often referred to as circuses.

Displays: are travelling collections of live animals put on display for viewing. They do not normally involve performances or contact with people.

Exhibits: are travelling collections of live animals where, in some instances, people are allowed to interact with the animals. They are commonly referred to as petting zoos.

Aquaria: are aquatic zoos where live plants and animals are placed in tanks and put on display. Although often equated with fish, many aquaria also contain reptiles, amphibians, and aquatic mammals.

Taking Live Animals into Captivity

■ There is no inventory of public and private zoos, aquaria, displays, shows, and exhibits in Ontario, and there is little specific legislation at any level of government to regulate the operation of these facilities. At issue are the types of animals permitted in zoos, the control of their activities, and the quality of care. In Ontario, the *Game and Fish Act* distinguishes between public zoos and private zoos. Private zoos are not allowed to keep native wild animals originating within the Province; whereas public zoos are not restricted as to the types of animals which may be kept. However, based on recent court rulings, the *Game and Fish Act* does not empower the Ministry to restrict private zoos from keeping imported specimens of native species. This has created a situation where government efforts to protect native wild life may be compromised.

Travelling shows and exhibits of wild animals are sometimes associated with private zoos or may be "stand-alone" operations. While these are few in number, they are unlicensed and difficult to monitor. There is also little information on how exhibit animals are acquired or disposed of when they are no longer useful to the operation. For example, some exhibits specialize only in young animals used for "petting". What happens to these animals once they are too old for the petting zoo? Some well managed and accredited zoos are operated in Ontario, and the Working Group believes they have a role to play in education, extension, research, and management.

There is no inventory of public and private zoos, aquaria, displays, shows, and exhibits in Ontario, and there is little specific legislation at any level of government to regulate the operation of these facilities.

The international trade in wild life is destroying millions of animals each year and seriously endangering many species.

Strategy 42: Prohibit the taking of live native animals, except by special licence.

The Ministry must ensure that legislation, regulations, and policies are developed to enforce this prohibition and to regulate the exceptions.

Finally, the Working Group opposes the taking, keeping, and confinement of non-native wild life for any activity. The international trade in wild life is destroying millions of animals each year and seriously endangering many species. We recommend that the Government of Ontario work with the Government of Canada and other governments to prohibit such activities. However, it is recognized that there are cases where capture may be necessary for research or to rescue wild animals from environmental catastrophe, habitat loss, and/or extinction.

Holding Live Animals in Captivity

■ It is recognized that there are some circumstances when captive native wild life can serve important cultural and social functions.

Strategy 43: Ensure that no wild animals are held in captivity, except under special licence.

Legislation is required to prohibit the holding of wild animals in captivity except under licence and in facilities which meet the standards set out in the regulations. The legislation might list the species for which licences may be granted. Holding animals for research purposes should only be authorized when the benefits of the research to the species or the ecosystem outweigh the disadvantages.

Education and extension programs can encourage the responsible use of wild life, and, as described in the following pages, can be used to inform the public about the issues of keeping wild life in captivity.

Zoos and Aquaria

It is recommended that native animals held in accredited zoos and aquaria come only from captivity, from rehabilitation centres, or from government facilities designed to manage and protect problem animals. For example, some rehabilitated animals which cannot be freed, or the progeny of native wild life which are born in captivity, may be candidates for zoos.

Strategy 44: Ensure that all zoos and aquaria are licensed.

It is recommended that the Government of Ontario establish standards for licensing of zoos and aquaria. To qualify for a licence, proponents should demonstrate expertise and experience in the care of animals, including animal health, animal husbandry, and general zoo operations, and submit operating plans addressing access to licensed veterinarians, safety and emergency procedures, health management, and financial and insurance planning.

Animal Shows, Exhibits, and Displays

The Working Group does not support the continued use of live animal shows, exhibits and displays. It believes that native wild life should not be subjected to the stresses associated with constant movement and relocation, and cramped living conditions.

Strategy 45: The Government of Ontario should prohibit animal displays, shows, and exhibits featuring live native wild animals.

The Government of Ontario should ensure that its legislation and regulations reflect this Strategy.

The Working Group does not support the continued use of live animal shows, exhibits and displays.

Use of Captive Animals for Recreation and as Pets

The Working Group recommends that the capture and retention of wild animals in captivity for recreational purposes or personal enjoyment should, with some exceptions, be prohibited. Among the variety of wild life species which have historically been held in captivity, falconry merits special mention. Falconry is the sport of hunting with trained raptors. There are approximately 300 falconers in Canada, 80-100 of whom practice in Ontario. Ontario falconers require approximately 25 wild raptors each year. Species of primary interest include the gyrfalcon, peregrine falcon, and northern goshawk. Of lesser interest are the Cooper's hawk, merlin, sharp-shinned hawk, American kestrel, and red-tailed hawk. Birds are obtained from the wild or are bred in captivity. Of the raptors of interest to Ontario falconers, only the peregrine falcon is considered endangered, while the Cooper's hawk is considered rare in the province.

Raptors are predators at the top of their food chain, and therefore relatively uncommon. They have been persecuted widely, have been subject to pesticide

poisoning, habitat destruction, and human disturbance. Raptors need an extra measure of protection.

From another perspective the sale of raptors can be lucrative; some birds are sold for thousands of dollars to falconers in middle eastern countries, for example. Therefore, there is considerable incentive to poach and sell raptors illegally.

The sport requires patience, dedication, commitment, expertise and experience in training and caring for the birds. Birds maintained for falconry have contributed to research on raptor behaviour, and techniques developed by falconers have contributed to improved care and handling of captive birds in facilities such as zoos. In recent years captively bred peregrine falcons have been used to re-establish wild populations throughout North America. In addition, falconry also has had an important educational value by dispelling public misconceptions about birds of prey.

The Wildlife Working Group identified a number of concerns about falconry:

- There is opposition to the removal raptors from the wild.
- Removal of endangered species, such as the peregrine falcon, could have a significant impact on wild populations.
- Falconry is a form of hunting; there is concern that falconers allow their birds to hunt "out of season".
- There are no guidelines or regulations for licensing falconers or establishing standards for the housing, health care, sanitation, handling, safety, training, or release of birds.
- There is concern that some breeders may be hybridizing species; escaped birds could dilute the gene pool.
- Captive breeding could encourage commercialization of birds with attendant poaching problems.

While the Working Group has serious reservations about permitting falconry, it is an existing use which is not considered to have a serious impact on populations and some beneficial aspects exist. Therefore it is an activity worthy of consideration.

The Working Group suggests that falconry should be restricted to selected species and governed by regulations, including documentation of each bird currently possessed by each falconer in Ontario.

Strategy 46: Prohibit the keeping of animals in captivity for recreation except in those circumstances where special regulations, controls, and legislation have been brought into force.

It recommends that the Ministry establish a "Falconry Advisory Committee" comprised of falconers, veterinarians, professional ornithologists, natu-

ralists, the Ministry, and other provincial government agencies. This Committee should be asked to recommend regulations and guidelines through broad public consultation, for licensing and monitoring of all aspects of falconry in Ontario. The Committee should provide advice to the Ministry on issues relating to the number of birds that a falconer can keep in captivity, monitoring standards, enforcement, inspection and educational activities related to falconry.

The Government of Ontario should encourage the Government of Canada to continue the practice of using falcons at airports by developing an appropriate set of regulations until such time as other means are devised for controlling birds at airports.

Pet Stores

Municipalities can pass by-laws to license and regulate pet stores, but requirements for standards affecting the housing and care of the animals are minimal. While some municipalities do have municipal by-laws exerting some limited control concerning provision for care, there are no provincial licensing controls in place for pet store operations. From the perspective of native wild life, pet stores have been the source of some problems over the years, particularly with respect to the sale of amphibians and reptiles. The current prohibition on the sale of turtles, due to the threat of transmission of *salmonella* bacteria, may have had some impact on reducing sales of animals acquired from the wild, but this is by no means a solution to this problem. In addition, the taking of native wild life for sale in pet stores is not consistent with the goal, objectives, and the guiding concepts of this Strategy.

Strategy 47: The keeping and sale of native wild animals by pet stores should be prohibited.

The Working Group deplores the taking of live wild animals from anywhere in the world for sale in pet stores, and strongly urges the Government of Ontario to work with the Government of Canada to eliminate this activity.

The Working Group deplores the taking of live wild animals from anywhere in the world for sale in pet stores, and strongly urges the Government of Ontario to work with the Government of Canada to eliminate this activity. In addition to the Group's opposition on ethical grounds, it is concerned about the treatment of wild animals in captivity. It is concerned that individuals who purchase wild animals from pet stores cannot provide the required accommodation and care. Education and extension programs should dwell on this fact.

Given the lack of appropriate legislation, it is critical that amendments to existing legislation or new legislation provide for the control of pet stores.

The Bait Industry

Many anglers use live bait to catch fish. Anglers use a variety of wild life species as bait, including: leeches, frogs, earthworms, crayfish, and fish. The bait industry is estimated to be valued at approximately two million dollars annually.

There is concern that the transfer of live bait may lead to the introduction of new species with their associated diseases and parasites into aquatic ecosystems. These introductions could result in significant negative impacts on ecosystems, such as the spread of the zebra mussel on crayfish to inland waters.

To address this concern, the Fisheries program should identify lakes or watersheds which are particularly vulnerable to the introduction of "foreign" bait so that local education and extension programs can be tailored to address this concern. The Working Group acknowledges that the bait industry does not conform to the guiding principles regarding wild life in captivity, but it is a long-standing use which should be allowed to continue.

The Biological Supply Industry

It is known that specimens for sale through biological supply houses are collected in Ontario, but the extent and impact of collection on ecosystems is not known. The Working Group recognizes the need for a reasonable quantity of preserved and living material for teaching and research purposes, but is concerned that the cumulative impacts of this industry may be significant. For example, what impacts has the industry had on amphibians, such as bull frogs, in Ontario? What species are taken? Where are they taken, and are they harvested and maintained humanely?

Strategy 48: Prohibit the collection and propagation of live native wild life and the collection of dead native wild life for commercial purposes, except under special licence.

The Ministry should establish a licensing system for persons and businesses involved in the collection of biological materials for sale to educational and research institutions. This step will provide information on the extent of collecting and provide a mechanism for setting limits on the industry.

Removal of plants and animals from the wild might be reduced by encouraging propagation in captivity, but this should only be permitted where facilities are designed to prevent escapes.

Game farming: is the husbandry of animals for the production of meat and other products in an intensive operation on small, fenced, closely managed farms or paddocks.

Game ranching: is the husbandry of animals for the production of meat, other animal products and hunting privileges, in an extensive operation where the stock roam over large areas in a more natural fashion.

Game Farming and Game Ranching

In Ontario, limited game ranching exists, but game farming is expanding rapidly. Wild ungulates are more efficient than cattle at converting forage into meat. On average, unimproved pasture can support more native grazing ungulates than cattle, and the industry contributes to agricultural diversification, especially on marginal farmlands, and in northern communities. It has always been legal to keep, propagate or sell non-native species, not subject to the *Game and Fish Act.* A Supreme Court of Ontario ruling of 1987 has extended this to include imported native wild life. As a result, native wild life species can be acquired from outside the province for farming purposes.

Although the game farming and ranching industries are in their infancy in North America, interest is high – more than 100 game farms have been established in Ontario. Non-native red deer and fallow deer are primarily farmed, but elk and other native Canadian species are farmed as well. At the present time interest in moose and black bear is minimal, as they are not easily farmed, but white-tailed deer farms do exist.

World markets for deer products are potentially worth millions of dollars to the market economy of this country, and Ontario game farmers are rapidly buying stock. These animals offer high protein, low fat, low cholesterol meat products eagerly sought by consumers. The sale of by-products such as antlers, tails and hides also has great market potential. But creating legal markets for meat and parts makes poaching more attractive, particularly if native wild life species are involved. This, in turn, translates into significantly higher enforcement costs and management problems.

World markets for deer products are potentially worth millions of dollars to the market economy of this country, and Ontario game farmers are rapidly buying stock.

Farming Native Wild Life

Some provinces have sanctioned game farming and ranching – some even permit the farming of native wild life, provided the stock comes from outside the province. The Working Group has a number of concerns about game farms which contain native wild life:

- The cost and efficiency of measures to control poaching of wild native

animals, and the sale of meat and other products.

- The risk of animals escaping, with unknown consequences.
- The possibility of introducing biologically and economically devastating diseases into susceptible wild or domestic animal populations as animals are transported from place to place, or escape.

The Working Group is concerned about the potential impact of farming or ranching of non-native species, particularly ungulates, on native wild life.

The Working Group does not support game farming of native animals, and with respect to game ranching, it is opposed to the hunting of, or pursuit of, animals held in enclosures. Encounters with wild life should take place in the wild.

Strategy 49: Prohibit game farming of native animals and game ranching of all animals.

For reasons cited above, the Working Group recommends that the Government of Ontario phase out native wild life game farms and compensate owners for their investment. The Government of Ontario must examine legislation and regulations to ensure that they reflect this approach.

Farming Non-Native Species

The Working Group is concerned about the potential impact of farming or ranching of non-native species, particularly ungulates, on native wild life. The potential for the transmission of disease such as tuberculosis and brucellosis to native white-tailed deer, and the subsequent threat of these deer to the Ontario cattle industry is real. The escape of farmed non-native species which might potentially establish breeding populations in the wild is also a concern.

Recent experience in other jurisdictions has demonstrated the potential for serious problems. The costs of controlling damage can be very large. It is urgent that the government of Ontario assess the status of farming of non-native ungulates.

Strategy 50: Freeze (no purchase of new stock, no establishment of new enterprises) game farming for non-native ungulates until June 1992.

The Working Group recommends that the Government of Ontario immediately freeze (no purchase of new stock, no establishment of new enterprises) game farming activity of non-native ungulates at current levels until June 1992. During the "freeze" the Government of Ontario should investigate and determine a course of action on the future of the farming of non-native wild life in Ontario.

Ensuring the Industry is Safe

The Government of Ontario must ensure that appropriate safeguards, through implementation of the appropriate legislation and regulations, are in place and that they are enforced effectively.

Strategy 51: Develop safeguards for the game farming of any new species prior to its use being authorized.

Licences should be issued for all non-native wild life species on farms. The Working Group strongly urges the Government of Ontario to establish the appropriate legislation, regulations, and policies which can be employed to protect against adverse impacts on native wild life, including genetic dilution, and the spread of disease and parasites. The government must establish an administration program, including a health program which addresses the housing and care of animals, a registry and licensing system, and a products tracking system.

Fur Farming

Fur farming involves the raising of mink, fox, fisher, marten, raccoon and lynx for commercial pelt production. Mink and fox account for more than 99 per cent of Ontario's farmed furbearers. Ontario fur farmers produce 40 per cent of the Canadian farmed mink and 10 per cent of the fox. The majority of these operations are family farms located in southwestern Ontario, particularly in Perth and Wellington Counties and the Regional Municipality of Hamilton-Wentworth. In addition to the species currently raised on fur farms, there is interest in attempting to raise coyote, wolf, bobcat, wolverine and beaver. The industry is intensively controlled and monitored by the Government of Ontario.

The number of active farms, and the inventory of animals fluctuates according to market conditions. Currently, the industry is in decline, the result of depressed pelt prices due to an oversupply on the world market, the "anti-fur" campaign, the worldwide economic recession, and milder winters.

The Working Group does not support the addition of new, non-native furbearers, particularly predators, to the fur farming industry. It is concerned that, in the event of an escape or accidental release, non-native furbearers, could significantly and negatively impact wild native animals through competition for habitat, transmission of diseases and parasites, and in some cases genetic dilution.

Strategy 52: Prohibit the use of any additional species for fur farming.

With the exception of the species currently farmed, the Government of Ontario should prohibit the addition of any more native species to the industry. For

The need to address rehabilitation is urgent as the interest and commitment is expanding, often under unacceptable conditions.

example, requests to introduce the wolverine as a fur farmed animal should be denied.

Animals From the Wild

In addition, the Working Group opposes the taking of any wild animal from the wild for fur farming operations.

Strategy 53: No additional animals should be taken from the wild for fur farming.

The Working Group is also concerned about the treatment of fur farm stock, and wishes to encourage the Government of Ontario to ensure that the animals receive appropriate care and are dispatched humanely. The Working Group heard some concerns regarding the humane treatment of fur farm stock, particularly with reference to killing at the time of pelting.

Sick, Injured, and Orphaned Animals

Rehabilitation is the care of sick, injured, and orphaned native wild animals. A primary goal of animal rehabilitation is to return a sick, injured or orphaned animal to its natural habitat with a survival potential equal to or greater than that prior to acceptance into a rehabilitation program. Rehabilitation also involves management of, and/or the euthanization of, those animals judged to have little or no chance of survival. Some animals which cannot be returned to the wild are logical candidates for zoos and educational facilities.

Although relatively few people are directly involved in animal rehabilitation, and rehabilitation has little impact on population management for all but rare, threatened, and endangered species, it is a growing concern, particularly to people living in southern Ontario.

The need to address rehabilitation is urgent as the interest and commitment is expanding, often under unacceptable conditions. At present there is no provincial legislation (and associated licensing system) to address rehabilitation. Nor is federal or municipal legislation appropriate. Humane societies are not equipped or staffed to handle the growing problem, and private funding for rehabilitation reception centres is inadequate. In addition, fund raising is hampered by the perceived illegality of the activity. There are no standards of operation, and veterinarians are not sufficiently involved.

Many rehabilitators lack formal training. Many are unaware of diseases and parasites which can be transmitted from wild animals. Clearly, training and educational programs focusing on the care of wild life are needed.

The Working Group detected strong support for the Ministry to become involved in wild life rehabilitation. Amendments to the *Game and Fish Act* seem to offer the most immediate way of establishing a legal licensing system.

Humane societies are not equipped or staffed to handle the growing problem, and funding for rehabilitation reception centres is inadequate.

Strategy 54: Recognize and foster a wild life rehabilitation program in Ontario.

The Ministry should immediately establish in legislation, regulations, and policies, a legitimate basis for animal rehabilitation in Ontario.

It is recommended that the Ministry establish an "Animal Rehabilitation Advisory Committee" comprised of government agency representatives, veterinarians, and rehabilitators to advise the Minister on matters relating to a licence system, on standards for animal rehabilitation, training of rehabilitators, and associated research. The Advisory Committee should address issues regarding the relationship between rehabilitators and zoos, and education and extension programs. The Working Group envisions a system where qualified rehabilitators function as course instructors and advisors.

Consideration should be given to the establishment of a network of reception centres around the province to provide facilities for the public to take sick, injured, and orphaned wild life, and to serve in the referral of these animals to qualified private rehabilitators. The Ministry should consider offering capital funding and some operating costs (on a matching basis) of reception centres and for educational programs and materials for rehabilitators and the general public. The Working Group does not recommend government funding of private rehabilitators, and recommends that the Government encourage rehabilitation organizations to continue in their efforts to raise supporting funds from the community at large.

LIVE NATIVE PLANTS

■ The collection and sale of live wild plants, particularly rare species, such as some orchids, is a recurring problem. The massive removal of ram's-head orchids and walking ferns from areas on the Bruce Peninsula, for example, has served only to increase their rarity. In addition, recent promotion of gardening with native plants has increased the pressure on local populations of some species. Declines in orchid populations in Rondeau Provincial Park, rare shrubs on the Sibley Peninsula on Lake Superior, and prickly pear cactus on the Lake Erie archipelago islands and in eastern Ontario are examples of significant ecological impacts caused by people collecting plants for personal use.

Strategy 55: Control the taking of live wild native plants.

The collection and sale of live wild plants, particularly rare species, such as some orchids, is a recurring problem.

The Working Group recommends that methods of controlling the taking of native flora be reviewed as a first step towards drafting legislation. Species to be protected should be listed in legislation or regulations, and provisions for licensing should be prescribed.

The Working Group recommends that the Ministry ensure that certain designated plants such as rare, threatened and endangered species, or other plants of concern are not taken or transplanted. The legislation should identify those species of live plants which cannot be collected. In addition, the regulations should address the management and control of seeds and cuttings.

The Working Group recognizes that some common plant populations can withstand the loss of individuals, and does not want to recommend that the public be denied access to such plants, but it does not support the indiscriminate removal of plants, particularly rare, threatened and endangered species for commercial or private propagation. It does believe government-sponsored and approved programs, conducted according to rigorous operating guidelines, are legitimate, particularly if they are designed to reintroduce or enhance native wild plant populations.

Also, it is recommended that the Ministry ensure that the impacts associated with the removal of live wild plants from their natural habitats are identified in education and extension programs.

PLANT AND ANIMAL COLLECTIONS

■ The Working Group believes that considerable educational value is derived through private collections of common plants and animals, but there are limits on the type and extent of such collections. Leaf and insect collections made by school children, and the collection of common plants for education programs, are examples of the types of activities the Working Group would like to see encouraged. The collection of rare, threatened, and endangered species, or animals which require special, often sophisticated, care for personal use are examples of collecting practices which must be discouraged.

Strategy 56: Regulate the collection of plants and animals for personal use.

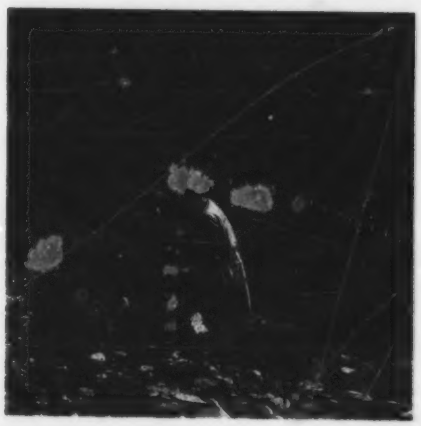
The Working Group recognizes that collecting plants and plant parts, such as fiddleheads, wild rice, mushrooms, and berries for personal consumption is a long-standing cultural activity. This Strategy is not intended to interfere with such uses where they are not detrimental to the population in question.

The Working Group believes that considerable progress can be made through education and extension programs, and encourages the Ministry to incorporate, in cooperation with non-government organizations, concerns about collecting wild life into their respective programs. The Ministry should ensure that education and extension programs include information on the ecological problems associated with the collection of wild life and on responsible behaviour.

Collecting for Personal Use

The Working Group believes that considerable educational value is derived through private collections of common plants and animals. But there are limits on the type and extent of such collections.

The collecting of common, small plant or animal wild life should not be discouraged where it is deemed ecologically sound and humane as part of education and extension programs. The Ministry should develop guidelines for collecting for incorporation into education and extension programs.



We should encourage children to appreciate and respect the natural world.
(Credit: Dave Fowle)

Many animal species are protected by law from unlicensed collecting, and many non-government organizations discourage their members from making personal collections of plants. There are, however, cases of rare and endangered plant, amphibian, and reptile species being collected for personal and commercial use. The Ministry should review current legislation and ensure that controls on the personal collection and use of wild life are clearly defined. The legislation should list species which cannot be collected.

Public and Institutional Collections

■ Most people attending the Working Group and Ministry workshops, as well as the other people who corresponded with the Working Group, believed that collecting for research and monitoring purposes is an acceptable use of wild life. Often, collecting is required because of the nature of the problem being investigated. It was emphasized, however, that collecting for research and monitoring purposes is only acceptable if populations remain self-sustaining and the collecting is conducted in a professional and humane manner.

Participants at Ministry workshops emphasized that the Ministry must continue to exercise its responsibility for maintaining and enhancing knowledge-gathering programs including scientific research and biological monitoring. University researchers emphasized that specimens must be properly deposited in museums and academic institutions, and wherever possible, tissue samples should be deposited in tissue banks maintained by museums or agencies such as the Canadian Wildlife Service, or by some other recognized institution with appropriate facilities.

The broad definition of wild life adopted in this Strategy makes regulation of such collecting difficult. Present policy and procedures simply do not account for the large number of species involved. A comprehensive review of legislation and policy is needed.

Strategy 57: Regulate the collection of plants and animals for inclusion in public and institutional collections.

It was emphasized, however, that collecting for research and monitoring purposes is only acceptable if populations remain self-sustaining and the collecting is conducted in a professional and humane manner.

The Working Group recommends that the Ministry establish an adminstration process to manage collections and assign a "Review Board" responsibility for screening and approving all applications for a Scientific Collector's Licence.

It is recommended that the Review Board include staff from the Ministry of Natural Resources, and representatives from the academic community, museums, and non-government organizations. The Board should require annual reports from all those who receive a licence and monitor the extent of collecting in the province. The Board should also oversee development of a list of wild life species for which collecting is not permitted, development of policies, and application screening procedures. All approvals should be made in consultation with Regional and District Ministry of Natural Resources offices.

Current and new legislation must provide the mechanisms to regulate public and institutional collections. The legislation or associated regulations should list species which cannot be collected. The Ontario Government should ensure that the protocol (such as the process provided for under the *Animals For Research Act*) outlining the handling and treatment of animals is current. The previous work of the Government's Animal Care Committee has used this process effectively, but it does not have a mandate to address some concerns such as the numbers of specimens collected. The Working Group believes that the geographic location of the collecting, the size of the collections, and the techniques of euthanasia, must be incorporated into regulations and monitored. The Animal Care Committee must also undertake to ensure that education and extension programs include material on the problems associated with the collection of wild life and on responsible behaviour.

HUNTING

■ Historically, aboriginal peoples and early settlers hunted for subsistence. More recently, hunting has been far more important as a form of recreation. Today, hundreds of thousands of Ontario residents spend more than 300 million dollars annually on hunting. When this figure is coupled with money spent by non-resident hunters, and given the continued importance of hunting to Ontario's aboriginal peoples, it is a significant, cultural, social, and economic activity – in some situations, it is an important ecological management tool.

Today, hundreds of thousands of Ontario residents spend more than 300 million dollars annually on hunting.

In the course of its deliberations, and in addition to poaching and allocation issues reviewed earlier, the Working Group identified a number of hunting issues, including: arguments for and against hunting, the types of hunting (such as hunting over bait and bow hunting), and the impacts of hunting on individuals, populations, and ecosystems (such as wounding rates, population management, and lead shot).

Arguments For and Against Hunting

■ Arguments for and against hunting are complex and result from the interplay of a number of different value systems. Some who oppose hunting do so because they are concerned about safety during the hunting season. Others view hunting as inhumane and unethical by virtue of the fact that it prematurely terminates life, wounds some animals, causing pain, and stresses them during the chase. Proponents of hunting argue that modern hunting techniques are quick and humane. They contend that hunting animals is ecologically acceptable, and in some cases necessary to prevent the devastating results on populations when they exceed the capacity of their habitat to support them. The Working Group believes hunting is acceptable only when it is consistent with the goal, objectives, and guiding concepts of this Strategy. For example, the Working Group is opposed to hunting for commercial gain through sale of parts.

■ The primary issues concerning the impacts of hunting which surfaced during the Working Group's discussions included: effects on populations, environmental contamination through lead shot, and public safety.

Strategy 58: Allow hunting to continue within the limits of sound ecological management.

Population management of hunted species has been a primary concern of all wild life agencies in North America, including Ontario. Considerable resources and expertise have been devoted to developing population monitoring and inventory programs, as well as sophisticated allocation procedures to provide an equitable distribution of hunting opportunities, and to ensure that over-hunting does not occur. The Working Group is satisfied that the Ministry has the expertise required to manage hunted populations. It is, however, concerned about the future of population inventory programs because of a general erosion of program funding in recent years.

The debate surrounding the use of lead and steel shot is complex. Lead is a notifiable toxic substance in the *Ontario Health and Safety Act* regulations. In small doses, lead shot causes fatal lead poisoning of waterfowl, and raptors which prey on waterfowl containing shot. It has been suggested that the use of non-toxic steel shot be used instead. But steel shot brings with it limitations as well. Some evidence suggests that use of steel shot increases wounding rates, for example. Recent research into the use of magnesium shot is promising, but given current market conditions, it is prohibitively expensive.

Impacts of Hunting

Population management of hunted species has been a primary concern of all wild life agencies in North America, including Ontario.

Ontario has an excellent hunter education program. (Credit: Ministry of Natural Resources)

While it is recognized that serious lead poisoning of waterfowl occurs in a number of hunting areas in the United States, its currently known only at Lake St. Clair in Ontario, where the Ministry and the Canadian Wildlife Service prohibit the use of lead shot. The Working Group supports this approach in the short-term, but recommends that monitoring programs continue to identify new "hot spots".

In addition, it recommends that the Ministry continue to evaluate the claim that the use of steel shot results in higher wounding rates. If the evaluation demonstrates that steel shot (or some other acceptable material) does not result in higher wounding rates, the Working Group recommends that the Ministry phase out the use of lead shot in Ontario.

The Working Group believes that humane treatment of wild life and public safety are important concerns, and should be a major focus in hunting programs. Ontario has an excellent hunter education program. The number of non-fatal and fatal accidents decreased significantly after the Ministry introduced a hunter education program in the 1960s. Currently, new hunters must complete and pass a basic hunter education training course, and in some cases must complete an advanced course if they wish to hunt certain species such as the wild turkey. But there is, and always will be, room for improvement. For example, interest in bow hunting has increased by almost 500 per cent in the last decade from 7,468 in 1980-81 to 44,075 in 1989-90, and the Working Group feels that education programs should be established for all bow hunters.

Strategy 59: Expand the hunter education program in Ontario

The Working Group recommends that the Ministry, in co-operation with non-government organizations, expand the hunter education program in a number of areas, by:

- Requiring all new bow hunters to successfully complete a bow hunting course, and encouraging current bowhunters to voluntarily participate.
- Developing species-specific hunter education courses and requiring all new hunters, and encouraging current hunters, to complete them.

The Working Group believes that animals must be dispatched quickly, and recommends that education programs emphasize techniques which minimize wounding. Therefore, shooting proficiency is an important aspect of hunter training. The recent closure of the Cold Creek shooting range near Toronto is of concern. These types of facilities are critical to competent hunter performance in the field. The Working Group recommends that the Government of Ontario charge a committee with responsibility for completing a review of shooting

ranges in Ontario to determine their number, location and accessibility. The committee could be comprised of representatives from government and non-government organizations.

In addition to poachers, there is a minority of hunters who ignore the law – people who endanger other hunters, the public, livestock and pets, and non-hunted wild life. For these people, education programs simply do not work. These few create an immense image problem for the majority of hunters who are responsible, careful, and abide by the law. The Working Group believes that the Government of Ontario should examine the need for stiffer fines and penalties for hunters who are convicted of an offence under wild life legislation.

Types of Hunting

■ The Working Group encountered some issues relating to the types of hunting permitted in Ontario, including hunting with bait and bow hunting.

Hunting with bait is the use of food or other incentives to lure wild life to a site where the animal can be killed. Many oppose this activity as unethical. Different kinds of baiting techniques are used to hunt wild life in Ontario. Hunters use calls to lure moose, wild turkeys, and waterfowl to a site and may use food to attract waterfowl. Waterfowl baiting is regulated under the Migratory Bird Convention Act and enforced by federal and provincial wild life officers.

It is recognized that the traditional practice of spring bear hunting over bait is a highly emotional issue involving ethical arguments about our use of wild life. The use of bait as part of a spring bear hunt actually allows hunters to be more selective and better comply with the regulation which prohibits the killing of sows with cubs. The Working Group believes that the practice of hunting in the spring is not in conflict with the goal, objectives and guiding concepts of this Strategy; however it does recognize that many people are opposed to this practice on ethical grounds.

In general, the Working Group believes that the practice of baiting should be examined in more detail. The various baiting techniques, and the positive and negative impacts on wild life resources require examination.

Little data and information are available on wounding rates. There is need to establish better baseline data on wounding rates associated with bow hunting and all other types of hunting. It is recommended that the Ministry review the impacts of various hunting techniques employed in Ontario.

Strategy 60: Review the impacts of various hunting techniques employed in Ontario, including wounding rates.

In support of this initiative, the Ministry might establish a research and monitoring program to assess the effects of baiting on the populations of wild life species, and the extent of wounding.

TRAPPING

■ Trapping has been intensively managed in the Province since 1911, and today Ontario has one of the most renowned furbearer management programs in North America. It consists of licensing, resource allocation, harvest quotas, field enforcement, harvest monitoring, control of the trade of raw pelts, research, and trapper education.

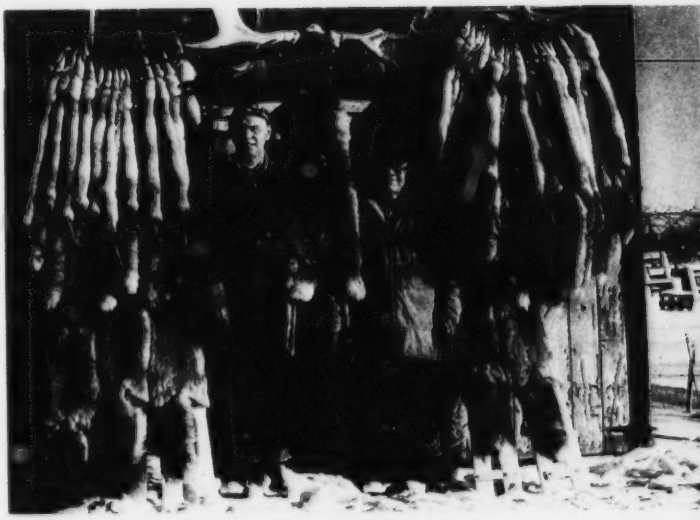
Twenty-four furbearing species are harvested each year in Ontario for their pelts; 12 of these species are also hunted. The most important species include muskrat, beaver, raccoon, and marten. Harvests fluctuate considerably from year to year in response to pelt price (as affected by fashion conditions and overall demand), species abundance, general economic conditions, and weather. Average annual earnings are $1,500, although a few trappers make more than $10,000 per year. The number of resident trappers declined by 11 per cent during the 1980s from 13,441 in 1980-81 to 11,982 in 1989-90, while the number of aboriginal trappers increased by 21 per cent from 2,430 in 1980-81 to 3,095 in 1989-90. The reasons for the decline in the number of resident trappers is unclear, but most

Trapping has been intensively managed in the Province since 1911, and today Ontario has one of the most renowned furbearer management programs in North America.

likely a result of a combination of factors including more rigorous education and training requirements and fluctuating economic conditions.

To obtain a fur trapping licence, a candidate must be at least 16 years of age, have resided in Ontario for seven consecutive months in the last 12 months prior to application, must have held an Ontario trapping licence within the previous five years, or must have completed a Ministry "Fur Harvest, Fur Management, and Conservation Course". The course contains segments on humane trapping technology, the biology of the animal, pelt handling techniques, and includes an examination. There are some exceptions to these requirements. Treaty Indians can trap without a licence at any time on Treaty lands, and farmer-trappers can trap without a licence on their farms. But if farmer-trappers wish to sell the pelts and carcasses, they must have a special licence to do so. If a trapper is convicted of any fur-related offence, his/her trapping licence is automatically cancelled, and can only be re-issued at the discretion of the Minister of the Ministry Natural Resources.

The Wildlife Working Group believes trapping is a legitimate use of wild life, but there are a number of issues surrounding the trapping industry which must be addressed.



Humane trapping techniques should be a primary focus in research and education programs. (Credit: Ministry of Natural Resources)

Strategy 61: Allow trapping to continue within the limits of sound ecological management.

Trapping should be permitted within the limits of an ecosystem approach to protection and management. Over the years, the Ministry has sponsored many fine studies on the ecology of a number of species, including the black bear, wolf, beaver, marten, fisher, and lynx. In addition, some work on parasites and diseases, including rabies, has been, or is being, completed. Currently, the Ministry sponsors aerial inventory programs for beaver.

The Working Group recommends that inventory and monitoring for

furbearers be enhanced. It recognizes that, for many species, inventory in the wild is very difficult. Most data and information on the distribution and abundance of trapped species comes from trapping statistics which may or may not reflect the true situation, especially effects of habitat change and disturbance. These are important aspects of an ecosystem approach to management. Some of the requirements for data and information on furbearers will be forthcoming from the Mammal Atlas Project. Trappers and managers could make important contributions to the Atlas.

A primary issue raised at the Working Group and Ministry workshops focused on the humaneness of the industry. In addition, there is considerable interest in ensuring that associated research and education programs are re-examined to ensure that humane trapping is given priority. Legislation and regulations should reflect any advances in the development of humane trapping techniques.

The Working Group recommends that the Ministry ensure that humane trapping techniques are a primary focus in research and education programs. Research on humane traps has been supported and conducted in Ontario since 1971, and the Working Group applauds the progress that has been made, but it believes that more work is required.

In its review of current practices and procedures, the Working Group was impressed with the comprehensiveness of the provincial fur management program. It is concerned, however, that some trappers are not required to qualify for a licence. The Working Group believes that all non-aboriginal people who trap, such as farmers, should be required to qualify for a trappers licence through the Ministry's "Trapper Education" program. Implementation of this requirement will require an amendment to the *Game and Fish Act*. In addition, the Working Group feels that aboriginal trappers should complete education courses as well, and recommends that the Government of Ontario encourage aboriginal peoples to establish their own formal training programs.

The Working Group is also concerned that upgrading courses are not required by law. Upgrading programs are important, particularly in these times of rapidly changing technology and in view of the concerns about humane trapping. Therefore, the Ministry should consider requiring all trappers to re-qualify for a trappers licence every five years.

WILD LIFE VIEWING

■ Viewing (and photographing) wild life is a widespread and popular recreational and educational activity in Ontario. About 20 per cent of Ontarians make at least one trip a year with the express purpose of viewing wild life, and about 50 per cent of the people who travel for other reasons encounter wild life during their trip. Approximately 10 per cent of Ontarians enjoy photographing wild life. Bird feeders and platforms are commonplace in backyards across the province, and in some areas people provide feed for larger animals like white-tailed deer.

Are the large numbers of people who are eager to view wild life actually harassing wild life and degrading their habitat? Are photographers getting too close to birds during the critical nesting period? Do people understand that feeding hummingbirds sugar water can lead to premature death? The Working Group is concerned that the public be knowledgeable and informed to avoid such problems.

While the Working Group acknowledges that there is risk in these kinds of activities, it believes that the advantages far outweigh the disadvantages. It recommends that the Ministry encourage this type of activity, but that it ensure that potential impacts and associated solutions are identified and incorporated into education and extension programs.

Strategy 62: Encourage viewing of wild life.

Bird feeders and platforms are commonplace in backyards across the province, and in some areas people provide feed for larger animals like white-tailed deer.

There is growing interest in "ecotourism" throughout the world, and Ontario is no exception. It hosts a tremendous variety of ecosystems – there are numerous ways in which to explore these ecosystems and the wild life which comprise them. Little work has been completed in this discipline in Ontario. For example, viewing locations around the province are poorly documented.

Are the large numbers of people who are eager to view wild life actually harassing wild life and degrading their habitat? Are photographers getting too close to birds during the critical nesting period?

In order to develop an effective viewing program, the Ministry needs to know what viewers want. The Working Group recommends that the Ministry develop a cooperative "Wild Life Viewing Committee" comprised of government and non-government organization representatives to oversee completion of a viewing database for the province, and to oversee development of a wild life viewing plan for the province.

There is growing interest in "ecotourism" throughout the world, and Ontario is no exception — it hosts a tremendous variety of ecosystems. (Credit: Ministry of Natural Resources)

The Ministry should ensure that information about where to view wild life is developed and distributed to the public. The Working Group was impressed with the Ministry's booklet entitled "Where To See Wildlife in South Central Ontario", and recommends that it complete guides for the entire province. Numerous non-government organizations are logical, and likely willing, partners for this type of project.

The Ministry should also review and amend the legislation and regulations to ensure that wild life are protected from harassment by wild life viewers.

In Conclusion...

This new approach requires that we address wild life protection and management in a broader social context than has been the rule in the past, that we redefine "wildlife", and that we adopt a comprehensive approach to the ways in which we manage our interactions with the living world.

■ The Wildlife Working Group has set out some strategic sign posts which it believes will guide the development of wild life legislation, policy and management actions over the next twenty-five years. Only time will tell how well we have succeeded.

We began with an almost overwhelming list of issues reflecting the values of a variety of people concerned about the future of wild life in Ontario. While the issues were complex and diverse – ranging from ecosystem structure and function to the care of individual animals – it was clear from the beginning that a new way of caring for wild life was needed.

This new approach requires that we address wild life protection and management in a broader social context than has been the rule in the past, that we redefine "wildlife", and that we adopt a comprehensive approach to the ways in which we manage our interactions with the living world.

We have tried to lay the foundation of this Strategy on these three concepts. Our social frame includes all people and all values associated with wild life. The recommended definition includes all of living nature. Our approach is ecosystem-oriented and focuses on the conservation of biodiversity. A primary objective is to make sure that wild life populations and habitats are sustained forever.

This new approach brings with it the need for change – change in the ways we have traditionally treated wild life. Most of these relate to the broadened definition of wild life and the ecosystem approach to the conservation of biodiversity. From an administrative viewpoint, a much greater degree of collaboration among agencies influencing wild life will be needed, and the range of "publics" having a stake in wild life will be more diverse so that reconciling divergent views will be crucial.

With respect to the traditional uses of wild life, we recommend change which we believe is consistent with changing perceptions of wild life values. The time may never come when the principles underlying accepted "uses" are entirely consistent and logical. Societal values will always play a large role in determining what is permitted.

As we say in the "Foreword", this is not a "final report" – it is a new beginning. We hope it will provide a stimulus for debate, for re-thinking and refining of some of the ideas it contains, and serve as a foundation on which future policy and action can be built.

(Credit: Shirley McAfee-Ryan)

Appendices

APPENDIX 1

TERMS OF REFERENCE

1. The Working Group will report directly through its Chair to the Minister or his or her designate.

2. The members of the Working Group are appointed by the Minister and will serve in their individual capacities and not as representatives of organizations or agencies.

3. The Working Group will prepare a Wildlife Strategy for Ontario for the Minister of Natural Resources.

   The Strategy will state a goal and objectives and will identify issues and alternate management actions, the evaluation of which will include cost/benefit analysis.

4. The Strategy will adopt a long-term approach and be forward-looking for it is anticipated that it will aid in guiding the Ministry and its partners in discharging their responsibilities with respect to wildlife well into the 21st century.

5. Issues and management actions will be identified as they relate to habitat, populations and utilization of wildlife by humans.

6. The issues considered will include but will not be limited to those discussed in the Ministry document: *Discussion paper: Towards a Wildlife Strategy for Ontario*

7. The activities of the Working Group will include at least two Workshops open to public participation by invitation and shall include, but not necessarily be limited to, representatives of the organizations listed in Schedule B in the *Discussion Document.* The first Workshop will be devoted to identification of issues and the second with recommended management options. A third Workshop may be necessary.

8. A report on each Workshop will be submitted to the Minister.

9. A final report to the Minister will include:
   (a) Issues and recommended associated management options.
   (b) A discussion of issues for which the Working Group was not able to recommend management options together with recommendations for a process for the resolution of these outstanding issues.

10. Amendments to the Terms of Refer ence and appointments and replacements to the Working Group will be subject to mutual agreement between the Chair and the Minister.

APPENDIX 2

CONTACTS

This Strategy was prepared with the extensive advice and assistance of a number of individuals and technical experts from government, industry, academic institutions, non-government organizations, and the public. However their invaluable participation in the development of this Strategy does not imply their agreement or endorsement of this document.

Addison, Edward, Ministry of Natural Resources, Wildlife Policy Branch

Alexander, W.C.F., Ontario Federation of Anglers and Hunters, Peterborough

Allison, Donna, Hanson's Wilderness Lodge

Andrews, William, Environmental Science Teachers Association

Ankney, Dave, Ontario Federation of Anglers and Hunters

Armstrong, Ted, Ministry of Natural Resources, Thunder Bay District

Bacon, John, Ministry of Natural Resources, Surveys, Mapping and Remote Sensing Branch

Bain, John, Ducks Unlimited Canada

Baker, Jim, Ministry of Natural Resources, Wildlife Policy Branch

Barbowski, John, Ministry of Natural Resources, Wildlife Policy Branch

Barnes, Bob, Ontario Trappers Association

Beechey, Tom, Ministry of Natural Resources, Parks and Natural Heritage Policy Branch

Bell, Patti, Ministry of Natural Resources, Wildlife Policy Branch

Bellamy, Karen, Ministry of Natural Resources, Eastern Region

Bisset, Alan, Ministry of Natural Resources, Northwestern Region

Black, Sandi, Canadian Association of Zoo and Wildlife Veterinarians

Boos, John, Barrie

Bowles, Jane, London

Bowman, Irene, Ministry of Natural Resources, Wildlife Policy Branch

Bradstreet, Michael, Executive Director, Long Point Bird Observatory

Brimacombe, Roger, Corporation of the Township of Strong, Sundridge

Bruemmer, George, Ministry of Natural Resources, Cochrane District

Bryant, Joe, Ottawa

Bryson, Susan, Ministry of Natural Resources, Eastern Region

Burgess, Neil, Canadian Society of Environmental Biologists

Buss, Mike, Ministry of Natural Resources, Algonquin Region

Carreiro, Joe, Canadian Wildlife Service, Environment Canada

Cartwright, D., Department of Natural Resources and Energy, New Brunswick

Cavanagh, Jack, Ministry of Natural Resources, Northern Region

Chambers, Bill, Northern Ontario Tourist Outfitters Association

Chavossy, Valerie, Ministry of Natural Resources, Corporate Policy and Planning Secretariat

Chromec, Moi, Ministry of Natural Resources, Wildlife Policy Branch

Coke, Alison, Ministry of Natural Resources, Corporate Policy and Planning Secretariat

Coleman, Kerry, Ministry of Natural Resources, Eastern Region

Crystal, Mel, Ministry of Natural Resources, Corporate Policy and Planning Secretariat

Cumming, Harold, School of Forestry, Lakehead University

Curtis, Steven, Canadian Wildlife Service, Environment Canada

Davies, Chris, Ministry of Natural Resources, Northern Region

d'Almeida, Maria, Ministry of Natural Resources, Wildlife Policy Branch

Darby, Bill, Ministry of Natural Resources, Fort Frances District

Desjardine, Ron, Ministry of Natural Resources, Central Region

De Yoe, David, Ministry of Natural Resources, Forest Policy Branch

Dickie, Ray, Ministry of Natural Resources, Conservation Authorities & Water Management Branch

Dickson, Bud, Northern Ontario Tourist Outfitters Association

Doncaster, Anne, International Wildlife Coalition

Donnelly, Margaret, Ministry of Natural Resources, Wildlife Policy Branch

Drysdale, Paul, Ministry of Natural Resources, Lindsay District

Dubreuil, Donna, Coalition for Wildlife

Dunn, Fraser, Ministry of Natural Resources, Aviation and Fire Management Centre

Duinker, Peter, School of Forestry, Lakehead University

Eckersley, Mike, Ministry of Natural Resources, Cornwall District

Elliott, Stephen, Ministry of Natural Resources, Northeastern Region

Emiry, Mack, Manitoulin - North Shore Federation of Agriculture
English, Gerry, Ministry of Natural Resources, Geraldton District
Euler, David, Ministry of Natural Resources, Wildlife Policy Branch
Field, John, Ontario Federation of Snowmobile Clubs
Fiset, Wayne, Ministry of Natural Resources, Gogama District
Fortier, Russ, Northwestern Ontario Tourist Association
Francis, George, Faculty of Environmental Studies, University of Waterloo
Frank, Ronald P., Federation of Ontario Bowhunters
Gardner, Bob, Canadian Association for Humane Trapping
Gardner, Jim, Ministry of Natural Resources, Algonquin Region
Gartley, Dale, Ministry of Natural Resources, Outdoor Recreation
Geddes, Douglas, Field Botanists of Ontario
Geist, Valerius, University of Calgary
Geleynse, Martin, Ontario Hawking Club
Gladders, Dave, Fur Institute of Canada
Glooschenko, Val, Ministry of Natural Resources, Wildlife Policy Branch
Glover, Gordon, Canadian Association of Zoo and Wildlife Veterinarians
Goddard, Kathy, Conservation Council of Ontario
Gordon, David, Ministry of Natural Resources, Corporate Policy and Planning
Grand, Janet, Canadian Nature Federation
Greer, Don, Ministry of Natural Resources, Conservation Authorities and Water Management Branch
Haarmeyer, Gerry, Ministry of Natural Resources, Northeastern Region
Hagan, Doug, Ministry of Natural Resources, Wildlife Policy Branch
Hanna, Ed, Ontario Federation of Anglers and Hunters, Peterborough
Harcus, John, Ministry of Natural Resources, Wildlife Policy Branch
Harris, Ross, Ministry of Natural Resources, Wildlife Policy Branch
Harrison, Frank, Ontario Forestry Association
Harvey, Stephen, Ministry of Natural Resources, Forest Resources Group
Head, David, Ministry of Natural Resources, Forest Resources Group
Hector, Don, Ministry of Natural Resources, Chatham District
Heerschap, Ernie, Ministry of Natural Resources, Gogama District

Hogg, Dave, Ministry of Natural Resources, Corporate Policy and Planning Secretariat
Hood, Bruce, Ministry of Natural Resources, Pembroke District
Horwath, Chris, Ontario Federation of Anglers and Hunters
Hounsell, Steve, Ontario Hydro, Land Use and Environmental Planning Department
House, James, Port Stanley
Houweling, John, Ministry of Natural Resources, Surveys, Mapping and Remote Sensing Branch
Hunter, Bruce, Ontario Veterinary Association
Hunter, Kathleen, Toronto Humane Society
Hunter, Pud, Ministry of Natural Resources, Aylmer District
Hunter, William, Ministry of Tourism and Recreation, Tourism Development Branch
Hussell, David, Ministry of Natural Resources, Wildlife Policy Branch
Hyde, Doug, Ministry of Natural Resources, Bracebridge District
Jenkins, Jackie, Wildcare
Johnson, Bob, Canadian Association of Zoological Parks and Aquariums
Johnson, Fred, Ministry of Natural Resources, Central Region
Johnson, John, Ministry of Natural Resources, Central Region
Johnston, David, Ministry of Natural Resources, Wildlife Policy Branch
Johnston, D. R., Ministry of Natural Resources, Northwestern Region
Jones, Scott, Ministry of Natural Resources, Sault Ste. Marie District
Kelly, Ben, Ministry of Natural Resources, Tweed District
Kennaley, Joyce, Ministry of Natural Resources, Wildlife Policy Branch
Kirkham, Ian, Federation of Ontario Naturalists
Kolenosky, George, Ministry of Natural Resources, Wildlife Policy Branch
Koski, Ken, Ministry of Natural Resources, Northeastern Region
LaForme, Harry, Indian Commission of Ontario
Lambert, Anne, Richmond Hill
Lancour, Ron, Hudson's Bay Fur Sales Canada Inc.
Letteau, Angie, Ministry of Natural Resources, Southwestern Region
Levine, Ellen, Wildlands League
Lindsay, Bruce, Lindsay and Associates
Low, Louis, Ministry of Natural Resources, Legal Services Branch

Lucas, Kelly, Ministry of Natural Resources, Wildlife Policy Branch
Lumsden, Harry, Aurora
Lytwyn, Victor, Ontario Native Affairs Directorate
MacInnes, Charles, Ministry of Natural Resources, Wildlife Policy Branch
Mack, Al, Ministry of Natural Resources, Land Management Branch
MacKay, Barry Kent, Zoo Check Canada
MacKenzie, Dick, Northwestern Ontario Associated Chambers of Commerce
Martin, Pat, Ontario Deer Farmers Association
Mason, Christine, Ontario Humane Society
MacLean, Jim, Ministry of Natural Resources, Director, Wildlife Policy Branch
Mallany, Stuart, Ministry of Natural Resources, Wildlife Policy Branch
Mansell, Dan, Ministry of Natural Resources, Huronia District
Mansell, William, Mississauga
Martin, Gary, Ministry of Natural Resources, Carleton Place District
Martin, Norm, Belleville
Mathay, Richard, Ontario Fruit and Vegetable Growers Association
Maw, Kenneth, Ministry of Natural Resources, Dryden District
Mazure, Michael, Ontario Fruit and Vegetable Growers Association
McCormack, Ian, Ontario Forestry Association
McGovern, Steve, Ministry of Natural Resources, Hearst District
McGregor, Ed, Ministry of Natural Resources, Eastern Region
McKenzie, Jack, The Federation of Ontario Cottagers' Associations Inc.
McKittrick, Bill, Ministry of Natural Resources, Wildlife Policy Branch
McLaren, Margaret, Ministry of Natural Resources, Wildlife Policy Branch
McLeod, Darryl, Ministry of Natural Resources, Fort Frances District
McMechan, Sylvia, Department of Environment and Resource Studies, University of Waterloo
McRitchie, Len, Foundation For North American Big Game
Milton, David G., Ontario Lumber Manufacturers' Association
Mispel-Beyer, Tom, Ministry of Natural Resources, Kapuskasing District
Miyasaki, Wilma, Ministry of Natural Resources, Wildlife Policy Branch
Morgan, Rick, Ontario Federation of Anglers and Hunters

Morrison, Ken, Ministry of Natural Resources, Northeastern Region
Neave, Dave, Wildlife Habitat Canada
Norman, Angus, Ministry of Natural Resources, Central Region
Novak, Milan, Ministry of Natural Resources, Wildlife Policy Branch
Nudds, Tom, University of Guelph
Obbard, Martyn, Ministry of Natural Resources, Wildlife Policy Branch
O'Donnaghue, Brian, Ministry of Natural Resources, Algonquin Region
Ouellette, Jerry, Foundation For North American Big Game
Palilionis, Alex, Ministry of Natural Resources, Owen Sound District
Parker, Kip, Wildcare
Parsons, Gary, Department of Environmental Conservation, New York
Patch, Jeff, Department of Natural Resources and Energy, New Brunswick
Patterson, Will, Toronto
Payne, Robert, Canadian Environmental Law Association
Pearse, Peter, University of British Columbia
Penney, Dave, Ministry of Natural Resources, Ignace District
Perera, Aji, Ministry of Natural Resources, Forest Management Branch
Phillips, Rick, Ministry of Natural Resources, Provincial Parks and Recreational Areas Branch
Pond, Bruce, Ministry of Natural Resources, Wildlife Policy Branch
Porteus, Lester, Ontario Fruit and Vegetable Growers Association
Powell, Robin, Toronto Field Naturalists
Pratt, Rick, Canadian Wildlife Service, Environment Canada
Prevett, Paul, Ministry of Natural Resources, Southwestern Region
Quinney, Terry, Ontario Federation of Anglers and Hunters
Rapley, Bill, Canadian Association of Zoological Parks and Aquariums
Reid, Doug, Ministry of Natural Resources, Northwestern Region
Remple, Rob, Ministry of Natural Resources, Wildlife Policy Branch
Richards, Norm, Ministry of Natural Resources, Provincial Parks and Recreational Areas Branch
Riley, John, Ministry of Natural Resources, Central Region
Riley, Kelly, Association of Iroquois and Allied Indians

Rivard, Ray, Ministry of Northern Development & Mines

Rizzo, Brian, Environment Canada, Ottawa

Roll, Bill, Ontario Forest Industries Association

Rowe, Stan, University of Saskatchewan

Roy, Alan, Union of Ontario Indians

Rumble, Peter, Ministry of Natural Resources, Conservation Authorities and Water Management Branch

Running, Ronald, and District staff of MNR Terrace Bay District Office

Sandilands, Bruce, Ministry of Natural Resources, Algonquin Region

Schneider, Richard

Schottroff, Jackie, Ontario Falconry Association

Seal, U., Captive Breeding Specialist Group

Simkin, Don, Ontario Federation of Anglers and Hunters

Skuce, Duane, Ontario Falconry Association

Sloan, Jill, Animal Defence League of Canada

Smith, Blair, Ruffed Grouse Society of Canada

Smith, Darryl, Ministry of Natural Resources, Chatham District

Smith, Howard, Ministry of Natural Resources, Wildlife Policy Branch

Smith, Mary, President, Federation of Ontario Naturalists

Smith, Murray, Ministry of Natural Resources, Wildlife Policy Branch

Smith, Peter, Ministry of Natural Resources, Wildlife Policy Branch

St. Germain, George, Rama Reserve, Rama

St. Martin, Roxanne, Ministry of Natural Resources, Wildlife Policy Branch

Stabb, Mark, Ministry of Natural Resources, Algonquin Region

Stack, Wayne, Ministry of Natural Resources, Northwestern Region

Stefanski, Ray, Ministry of Natural Resources, Wildlife Policy Branch

Stewart, Robert, Ministry of Natural Resources, North Central Region

Strebig, Marion, Federation of Ontario Naturalists

Strickland, Dan, Ministry of Natural Resources, Algonquin Park District

Stroeher, Hermann, Tourism Ontario, Inc.

Sturgeon, Glenn, Ministry of Natural Resources, Owen Sound District

Tapscott, Brian, Ministry of Agriculture and Food

Timmerman, Tim, Ministry of Natural Resources, North Central Region
Toole, Steve, Ministry of Natural Resources, Atikokan District
Turner, Monika, Ministry of Natural Resources, Outdoor Recreation
Tworzyanski, Tom, Ministry of Natural Resources, Forest Resources Group
Ugarenko, Len, Ministry of Natural Resources, Corporate Policy and Planning Secretariat
Uyenaka, Joe, Ministry of Agriculture and Food
Vinet, Jane, Canadian Association for Humane Trapping
Voigt, Dennis, Ministry of Natural Resources, Wildlife Policy Branch
Wachsmuth, Bill, Ministry of Natural Resources, Forest Resources Group
Ward, Paul, Ministry of Natural Resources, Aviation and Fire Management Centre
Watt, Bob, Ministry of Natural Resources, Northern Forest Development Group
Wedeles, Chris, Canadian Society of Environmental Biologists
Weilandt, Peter, Ministry of Natural Resources, Northeastern Region
Welsh, Dan, Canadian Wildlife Service, Ontario Region
Wheatstone, Bill, Ontario Fruit and Vegetable Growers Association
Whistance-Smith, Laurel, Ministry of Natural Resources, Wildlife Policy Branch
Wiken, Ed, Environment Canada, Ottawa
Wilkinson, Bette, Ministry of Natural Resources, Wildlife Policy Branch
Williams, Owen, Ministry of Natural Resources, Southwestern Region
Wilson, Janice, Citizens Against Hunting
Wilton, Mike, Ministry of Natural Resources, Algonquin Region
Winston, Iris, Canadian Federation of Humane Societies
Winter, Chris, Conservation Council of Ontario
Winterton, Guy, Ministry of Natural Resources, Northwestern Region
Wolfe, Jeff, Wolf Track Deer Farms
Wray, David, Ministry of Natural Resources, Forest Resources Group
Wright, Robert, Ontario Ministry of Agriculture and Food
Young, Jim, Ministry of Natural Resources, Central Region
Yungblut, Jim, Ontario Soil and Crop Improvement Association

APPENDIX 3

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